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CONTENTS.

THE dangers of natural gas fuel have been strikingly illustrated lately, by three severe explosions in a single day, resulting in the demolition of two houses, and the fatal burning of one or two persons. The gas obtained from the wells in the Pittsburgh region issues from the earth under great pressure, so that it is not easily confined in pipes, and it has the additional quality of being nearly inodorous, so that its escape is not so quickly detected as in the case of coal gas, and a leak is very likely to lead to a dangerous accumulation of the explosive mixture which it forms when diffused in ten or twelve times its bulk of air. In the first case reported, the occupants of a house in which the natural gas was used as fuel were awakened by a smell like burning paint. Two persons went together to the basement to see what the matter was, taking a lamp with them. Nothing seems to have attracted their attention, until the one carrying the lamp raised it above her head, when the accumulated mixture of gas and air at the top of the room exploded, burning them both in a shocking manner, and blowing out the front of the house. There was in this case no reason to suppose that the gas escaped through the house pipes, but a leak was discovered in the street main, the gas from which is supposed to have forced its way through the ground beside the service-pipe, and so into the house. In the second case there were no gas-pipes in the house, and the nearest street main was thirty-five feet away; but it is tolerably certain that gas must have escaped from the street-pipe, and have found a passage through the earth and the foundation wall into the cellar, where it accumulated under the ceiling, a little of it working upward through the crevices of the floor. The small stream escaping about the hearth of a fireplace in the first story took fire, burning with a blue flame which attracted the attention of one of the young ladies of the family, who called her brother. He, very naturally, proceeded to the cellar with a lamp to investigate the phenomenon, but as soon as the cellar door was opened a violent explosion took place, completely destroying the house, which was of brick, and burying all the inmates in the ruins, fortunately without fatal injury to any of them. Of the third case, which occurred in Pittsburgh, the accounts are very meagre, but it seems to have resulted in the demolition of a store, and in damage to property in the neighborhood. As some of the wells produce enormous volumes of gas, one, we believe, delivering something like ten million cubic feet a day, their capacity for doing mischief unless the flow is properly controlled is almost unlimited, and as at least one-half of the serious gas-explosions in cities are traced to gas from leaky street mains, finding its way through brick or stone work into cellars or sewers, it is very desirable that the conduits for conveying natural gas, particularly when under its original tension, of one or two hundred pounds to the square inch, should be made secure beyond a doubt by rigid inspection.

A CURIOUS illustration of the importance of remembering the expansion of metals under heat is found in a story told in the *Scientific American.* It seems that a new railway, connected with the Midland system, was recently opened for business in England. The track was laid in the winter, and the engineer seems to have forgotten that steel rails would expand in warmer weather, or else to have supposed that the coëfficient of expansion, less than one one-hundred-thousandth of their length for each Fahrenheit degree of temperature, was too small to be appreciable; so he laid the ends of the rails nearly together. In consequence of this oversight, when summer arrived the track began to move. The ends of the rails were forced together by the expansion, and as they could move no further in the direction of their length, they were obliged to give way laterally, and the track spread in this way so seriously as to prevent its use, and the whole business of the road was suspended until the rails could be taken up and relaid with a proper interval between them. For architects, the effects of expansion by heat are perhaps more commonly to be observed in steam-pipes than anywhere else, and careful provision must be made for this in many cases. We saw, not long ago, an exhaust-pipe led into a ventilating-flue, near the top. The ventilating-flue was of galvanized-iron, and a long opening had been made in the side, fitted with a door sliding vertically, the exhaust-pipe passing through the middle of the door. The value of this arrangement was shown on turning steam into the pipe, which expanded in a few minutes so much as to lift the upper end, and with it the sliding-door, two and five-eighths inches. If the pipe had been inserted without precaution in a brick flue, as might readily happen if the architect or builder were careless, the first admission of steam into it would probably have pitched the chimney into the street.

A RATHER barefaced deception is said to have been practised of late by certain English dealers in metals, in selling large quantities of steel made by the Bessemer or similar processes as "cast steel." Although Bessemer steel is literally cast in ingots on removal from the converter, the name of "cast steel" has always been understood in the trade to mean crucible cast steel, which is made either by melting the best blistered steel in a covered crucible, or by melting pure iron, and carbonizing it with charcoal. However made, crucible cast steel is the best and most costly form of carbonized iron, and sells ordinarily at about ten times the price of Bessemer steel, so that whatever may be the merit of Bessemer steel as now manufactured, its sale under cover of a name appropriated to a far more valuable product is a disgraceful fraud. The first public intimation that such tricks were practised in the trade seems to have come from Dr. Webster, who was for many years Consul for the United States at Sheffield, and has recently written an official report on the manufacture of steel; but some confirmation of his accusation is to be found in the fact that after the matter was called to the attention of the British Iron and Steel Institute, the Sheffield manufacturers refused to allow their establishments to be inspected, and caused the annual meeting of the Institute, which the members wished to have held there, to be transferred to a distant place.

THE *Scientific American* gives a very clever imaginary picture of Captain Eads's Tehuantepec ship-railway, accompanying it with a good deal of interesting information about the details of the scheme. Most persons know something of the general features of the railway, which is intended to consist of three parallel tracks, over which three double engines, pulling together, are to draw a huge cradle, containing the vessel which may need transportation, from the Atlantic to the Pacific. After a ship is fairly balanced on the cradle, and supported by the shores which can be placed in all directions about it, there seems to be no reason why it cannot be dragged a hundred and thirty-four miles over moderately easy grades, but the placing of a floating shell, loaded with three or four thousand tons of cargo, on the cradle, is a delicate matter, and the most ingenious part of the scheme is the lifting pontoon by which the transfer is effected. In substance, this consists of a forest of hydraulic rams, which are submerged in the water of the dock as the vessel to be treated enters it. The rams are attached to a huge cellular raft of iron, and as soon as the ship is in position, the water which previously filled the cells of the raft is pumped out, gradually floating it, and lifting the vessel upon it out of the water. The railway cradle is placed on the pontoon before the ship is floated over it, in such a way that the pistons of the hydraulic rams can move between the timbers of the cradle, and as soon as the discharge of the pontoon begins to lift the ship from the water, the rams are set in operation and the pistons pressed against the hull, supporting it with a force

which can be very delicately regulated. When the pontoon has floated high enough to raise the cradle to the level of the railway, the shores are adjusted, and the valves of the rams opened, allowing the ship to settle into place on the cradle, which is then drawn upon the track. A similar device unloads the vessel at the other end of the line. The road is nearly straight, so that the cradle, four hundred feet long, can move almost without interruption from one end to the other; but five turn-outs are provided for, where, by means of floating turn-tables, the movement of the cradle and its load may be changed in direction, or the whole may be shifted to a side track, if desired, for inspection or repairs. It must be confessed that there is something attractive in the novelty and ingenuity of the whole plan, and there would be a considerable satisfaction in seeing it carried out, if not at Tehuantepec, perhaps at some other place.

M. PLANAT indulges, in the last number of *La Semaine des Constructeurs*, in some very interesting anticipations with regard to the future of aërial navigation, suggested, apparently, by a new experiment of Messrs. Renard and Krebs, who succeeded twice in one day in making a tour of thirty-five to forty-five minutes duration, returning in each case to the point from which they started. It is natural that this small but assured success should have called the attention of engineers and physicists again to the construction of balloons, and many suggestions have been made in regard to the best ways of building and sailing them, some of which will undoubtedly be tested before long. Reasoning from the examples of vessels to float upon the water, which gain in swiftness and in facility of handling with increase of size, the most obvious way of improving balloon navigation would seem to be by making the balloons larger, giving them at once greater steadiness and power, and enabling them to carry a heavier load of machinery to operate them. Nothing but metal would be suitable for balloons of great size, but with sheet copper, riveted like a steam-boiler, an envelope could be made, which would, within comparatively moderate dimensions, weigh only one-third as much, with its gaseous contents, as the air which it displaced. A copper balloon would be strong enough to admit of forcing through the air with all the speed which the machinery it could carry would be capable of imparting to it, and the next step to practical sailing through the air would be the invention of a motor lighter than anything yet known. Although Messrs. Renard and Krebs are believed to have employed in their balloon either a secondary electric battery, or a voltaic battery of great power, which is probably the best apparatus at present available for the purpose, few persons can think long over the problems of aërial navigation without arriving at the conclusion that the balloon motor of the future is likely to be a gas-engine of some sort. As hydrogen burns, or rather explodes, with its greatest force when mixed with eight times its weight of air, a balloon-engine, employing hydrogen, either compressed or not, as fuel, would draw eight-ninths of its fuel from the air around it; or, to put it in a different way, a hydrogen-engine using the gas simply as a fuel would, under such circumstances, do exactly as much work as a coal-burning motor consuming six times as great a weight of combustible matter.

WITH a balloon of the dimensions which engineers now contemplate, the fuel necessary for driving it through a journey of moderate length could be taken from the gas which held the whole suspended in the air without serious harm, especially if the balloon were charged to a pressure a little above that of the atmosphere, so that the consumption of the gas in the motor would not, by reducing the tension too much, expose the copper envelope to danger of collapsing; and M. Planat believes that this plan is likely to be tried. As to the advantages to be obtained by using the gas explosively, instead of as mere fuel, little is yet known, but if, as seems probable, investigation will teach us how to use more effectively the energy developed by explosions, it may be possible, as he suggests, to use a variety of substances in that way, in case hydrogen from the balloon should not prove serviceable. Again, as M. Planat says, the apparatus of cylinders, pistons and cranks by which power is converted into motion in terrestrial locomotives seems heavy and clumsy in a balloon, and he calls attention to the way in which the expansion of burning gases is used to urge forward rockets as a possible indication of a method in which the explosion of charges of hydrogen may be made to push a balloon through the air, without the intervention of any heavy machinery whatever. There is material enough in these suggestions for many new, and perhaps successful experiments; and so much interest is felt in the subject at present that we shall hardly have to wait long before some of them are tried.

A NEW kind of elevated railway is described in *Le Génie Civil*, as the invention of M. Angely, a French engineer; the principal point of novelty about it being that the cars are hung below the track, and have, according to the illustration published with the account, much the air of trains of caterpillars crawling along the underside of a twig. Like the Meigs railroad, about which so much discussion took place a year or two ago, the track consists of a single rail, but the suspension of the cars beneath the rail makes it possible to carry two rails, constituting a double track, from a single row of posts; the rails being hung from the ends of a short T, or double bracket, securely fixed to the posts by means of collars in the middle, through which the posts pass, rising some distance above, in order to give points of attachment for rods or cables, which sustain the rails at short intervals. In some respects this plan offers the best and cheapest solution of the elevated-railway problem yet devised. The posts are intended to be about forty feet high, and of plate iron, fixed in the ground by bolting to a mass of concrete. Spaced one hundred feet apart, they would occupy a comparatively trifling space in the roadway, and could be made perfectly capable of sustaining the double track, partly by means of the cross-pieces, strongly made of plate and angle iron, and partly by the braces from the top, which would not only be economical, but might serve to stay the cross-pieces, so as to prevent them and the posts from oscillation under the unequal movement of the trains. The track, according to the plan, is composed of a long lattice-girder, but with supports every twenty-five feet, as shown, a special rolled beam might perhaps be advantageously substituted for this, and the only thing then needed to complete the double line would be the horizontal wind-bracing between the tracks. Compared with the system in use in New York, where a double track requires at least two rows of posts, besides four continuous lattice girders, and a forest of ties and braces, the Angely scheme seems to promise considerable advantages, and although we should say that for nervous ladies a trip in one of his cars would be only second in point of discomfort to a voyage in a balloon there are no prejudices which habit will not overcome.

THE most efficient machine for killing our fellow-men yet invented appears to be the Maxim machine-gun, a utensil which any person can carry without difficulty into battle, and, having levelled it at his enemies and supplied it with a quantity of ammunition, he need do nothing more than turn a crank once, and retire to a place of safety. The gun then begins shooting by itself, and continues to fire bullets at any rate desired, from two a minute to six hundred, until its cartridge-belt, which contains three hundred and thirty-three charges, is exhausted. The advantages, to a warlike person, of being able to kill three hundred and thirty-three persons at a single effort, without exposing his own valuable person to injury, are so obvious that there is likely to be an extensive demand for the new instrument among Christian nations, and no one should fail to acquaint himself with the principles on which it acts. Every one knows something of the machine-guns hitherto used, the Gatling gun, with its six barrels tied together by bands, and the crank at its rear, being perhaps the most familiar, but all those hitherto used differ from the Maxim gun inemploying a continued force from the outside, generally applied to a crank or lever, to fire the charges, while the Maxim weapon loads and fires itself, after the first shot has been discharged, by utilizing the recoil of each discharge to effect the necessary movements; an ingenious system of springs and levers, operated by the barrel, which slides back about half an inch at each explosion, extracting and throwing away the shell of the cartridge just used, putting another in its place, pushing the barrel forward again, cocking the hammer and pulling the trigger, and repeating the whole series of movements as the barrel slides back again by the recoil of the new discharge. With all its ingenuity and apparent complication the new gun seems from the tests to be substantial enough for active service, and it is much to be hoped that the occasions for employing it will be rendered rarer by the very fact that its efficiency will make it dreaded.

OLD COLONIAL vs. OLD ENGLISH HOUSES.



THE almost universal use of wood in the construction of country houses owned by wealthy citizens is often a matter of surprise to foreigners visiting America. The early colonists, being comparatively poor, naturally availed themselves of this material, which was at hand in abundance. Why the well-to-do American of to-day should continue to build his country house of wood is perhaps explicable on the grounds that custom, rather than rational consideration, has guided him in his choice. Many writers and architects have found so much to admire in old colonial buildings that in recent years we have had a following more or less of the old work. Without denying the many points of excellence in this work, it would seem that fashion and the love of the picturesque have given the chief stimulus in this direction. We can admire, on the exterior, the almost microscopic fineness of delicate members on cornice and balustrade, and the pleasing effect of white and yellow paint, but at the same time it must occur to every thinking observer that much applied moulding and mitreing in wood is constructively objectionable. Sooner or later, depending on the care of the owner and his liberality in the use of paint, those mitre joints must open. The whole construction is at fault where any permanency is desired.

The early colonial builders knew something about Classic architecture, but their own ideas were very limited, and they seldom rose much above the imitation of stone-work in wood.

From an æsthetic standpoint, the regularly recurring horizontal lines of clapboarding have a hard, monotonous, inartistic effect, which is rendered still worse at the angles of the building by the straight, severe edges of the corner-boards. Contrasted with the less regular lines of masonry, the effect is poor. Architects have felt this; hence the more frequent use, lately, of shingles for covering large wall-surfaces.

If wood is still to be the main material used in country dwellings, some improvement should surely be sought, by using in conjunction with it a material less inflammable and more enduring. To cover the roof with tiles or slates, and the wall-surfaces with cement instead of clapboards or shingles would be a step in the right direction. We find numerous examples of this construction in the domestic architecture of England in the sixteenth and seventeenth centuries. As an illustration, we reproduce some sketches [see Illustrations] of houses in an old Suffolk village, Lavenham, which was one of the places visited this year by the London Architectural Association. Containing, in addition to its quaint old houses, a fine church, it is well worthy of a visit. Some sketches of wood-work from the interior of this church will be given in a future number.

The house in the sketch marked "*a*" was built about the year 1650, and it is in a habitable state and good condition now. The wood-work is of oak, and the roof is covered with tiles, originally red, now a dark brown. The surface of the walls is plastered, and the ornamental scroll-work was no doubt worked on the wall while the material was in a soft state, in the same way as the fine plaster-work on ceilings of this period was executed.

The villagers of Lavenham, with an appreciative eye for the effect of color, tinted the exterior plaster-work. Some houses were yellow, of a creamy color, others of red of various shades, from terra-cotta to "crushed strawberry;" others again were pure white. The street views "*b*" and "*c*," one of which, "*b*," is reproduced from a water-color sketch by a member of the Scottish Water-Color Society, will give an idea of the picturesque grouping and sky-line. From almost any point of view the pleasing variety of color — rich umber of the oak and the dark red of the tiles — makes a fascinating subject for the water-color painter. The wall-surface of house "*a*" was colored a light red; the repeated coats of color-wash and the action of the weather had softened the arrises of the ornament, and the effect of this work in low relief was very fine.

In "*d*" and "*e*" an indication is given of the ornament on the wood-work. For the most part it was cut out of the solid, dentils of various forms, ribbon-patterns, incised work and carving in low relief were favorite modes of enrichment. If we consider the right treatment of wood-work for exteriors, all the ornament needed can be had by moulding or cutting out *below* the surface of the timbers instead of building out and tacking on pieces, as the old colonists did. Still further, if carving is required, the best effects will be obtained by cutting with incised lines, with little or no modelling of surfaces. This enriches without losing the value of the constructional forms whether in a corbel or a gable rafter.

The capabilities of cement and its treatment are inexhaustible. First, there is the plain surface and different ways of finishing it in texture and color. There are simple, cheap and effective ways of treating the wall-surfaces. The age and good condition of these old houses is a practical test of the material. It may, however, be urged by some that although such plastered surfaces may stand in England, they will not stand the test of the climate in this country. Nothing could be more trying than the moist atmosphere, the searching, heavy rains and the variable weather in England during the winter months. As plastered surfaces have not been used externally in this country except on a small scale, the practicability of such work has yet to be tested.

Appended is the opinion of a gentleman who has had a very extended experience in the use of cement, both in England and America. R. BROWN, JR.

THE subject in the foregoing article is one on which a great deal could be written, and I should be glad if the little I can say on the subject would be the means of removing a wide-spread, but ungrounded prejudice, that appears to possess the minds of the majority of architects in this country against the use of lime and cement for outside finishing.

When we take into consideration the great variety of effects, both in color and form, that can be introduced so readily and by such simple means, it appears strange that the subject should have so long remained dormant. Doubtless many of our rising architects would like to indulge their taste in this direction, but for the fact that they have no confidence in external plaster-work; they will argue that it will not stand the extreme changes of this climate. As a worker of lime and cement, who has had considerable experience in outside plaster-work, I must say that this assertion is simply ridiculous, when so many examples can be referred to, even on this continent, for I am told that in Canada, where the climate is even more severe than in the United States, there are many of the old houses with plastered exteriors now in good condition, that have stood the test for over a hundred years.

If we compare the climate of this country with that of England, I think it will be readily seen that the atmospheric conditions are more trying to outside plaster-work there than here. In England the atmosphere holds much moisture, which plaster will more or less absorb. Under such conditions it would certainly appear to be more susceptible of injury by frost. Very often, in the fall of the year, a rainy season sets in; everything is soaking wet for weeks, and then, suddenly, sharp frost will follow. This state of things certainly appears to me to be very much more trying to lime and cement work than the usually dry state of the atmosphere here; but we do not find that this work is affected, and numerous examples can be seen in England and Scotland which have stood the test for hundreds of years, and appear to-day as good as when the work was first done.

The methods adopted by our English ancestors in preparing the lime, especially for external use, were somewhat different from the present ways. Boiling the lime (unless it was for inside finish) was seldom adopted. In the spring of the year the lime was taken in large quantities fresh from the kilns, and as soon as possible sprinkled with water and allowed to slake to a powder; it was then passed through a sieve, usually a quarter-inch mesh. Next it was mixed with a little sand and made into a very stiff mortar, piled into one large heap and smoothed all over on the outside, to prevent, as much as possible, the moisture of the lime escaping. The lime thus prepared would probably not be used for at least six, or oftentimes twelve months afterwards, as it was not considered safe from blistering until kept for that time. When this lime was brought into use, it was mixed with as little water as possible, then a sufficient quantity of sand was added, and the whole rendered plastic by the use of beaters. It will be perceived that mortar so prepared would be very tough. When hair-mortar was required, cow-hair of the best kind only was used, and it was as a rule well beaten and thoroughly hooked into the lime, so that the hair was well separated, and not in lumps, as is often the case in these days.

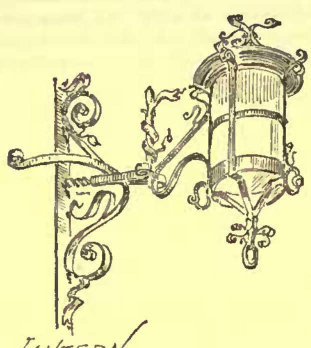
There is another point that must not be lost sight of in the construction of those long-standing examples of half-timbered houses: this is, that the laths are usually made from selected English oak, as straight-grained as could be had, and split (the sappy parts being avoided) and nailed with wrought-iron clout nails.

Thus far I have endeavored to show the process of preparing the mortar in olden times. The mode of application was much the same, I have no doubt, as at the present time in all good work, by first putting on and pressing well between the laths, to insure a good key, a fair coat of well-haired mortar, the surface of which should be made rough by scratching. This coat should be thoroughly dry before the next coat of mortar is applied. The second coat should be from one-half to three-quarters of an inch in thickness, the surface of which could be worked into simple ornamental forms while in a plastic state, or the surface could be finished in "slap-dash," which is simply mortar made very soft and thrown on to the surface of the plaster with a scoop. This is the commonest way of finishing outside plaster-work, and may be rendered very effective, particularly when color is used in the mortar. Another very pleasing way of finishing is

"rough-cast" or "pebble-dash," which is done by throwing small pebbles or shingle into the mortar while it is in a soft state.

Having thus far endeavored to show the practicability of outside plastering in this country, we must not forget in conclusion that we have the material: the limes of America are excellent, and we have the advantage of splendid natural hydraulic cements, which could be used with the lime and produce a mortar fully equal to any of the mortars used in former days. ROBERT JACKSON.

THE "*CASTALIA*" HOSPITAL SHIP.



LANTERN. WRO'T IRON MODERN.
MONITEUR DES ARCHITECTES.

THE twin-ship "*Castalia*" was bought some little time ago by the managers of the Metropolitan Asylum Board of London to convert into an hospital for small-pox patients. The managers had the matter before them of making floating hospitals on pontoons, and this vessel, the "*Castalia*," suited their views very well; they entrusted the conversion of the vessel into a hospital to Mr. Adam Miller, of Riches Court, Lime Street, London.

It was decided to make five large wards of the old cabin arrangement, and to build five other wards on the top, and place them *en échelon* (Figs. 1 and 2), so as to have them at angles with the centre line of the ship; giving more air, better light, and also reducing the number of patients in each ward; in fact these upper wards are each a cottage-hospital of itself. The dimensions of the wards vary a little, but the height is 23 feet, that is to say, the walls are 13 feet and the roof 9 feet. The windows are made similar to those in the hospitals on land, and are 7 feet by 3 feet.

The inlet of air is by slides worked by a screw, so that the quantity of air admitted may be graduated to the amount required. The air is drawn out by Boyle's extracting ventilators; each ward has two of those large ventilators, and, in the event of calm, close, sultry weather, there is fitted to each ventilator an air-blast, sent up from a large Farmer blower of Schiele's make, fitted in the engine-room below. This blast of air is sent up the pipes of the ventilators and causes an upward current of air to take place in these pipes. In this way the wards are kept cool and the air changed so many times an hour in each ward.

Each of the isolating rooms, bath-rooms, and lavatories is fitted with Boyle's ventilators and air-inlets similar to the wards. The hospital throughout is heated by steam coils, fitted by Messrs. Ridsdale and Co., Minories, London, each coil having a separate inlet and outlet into silent blow-off pipes. The temperature in any compartment may be raised or lowered as required, or as the doctor decides.

The upper hospitals with the isolating wards (Figs. 1 and 2) contain a large cubical space. There are attached to these upper wards, at each end of the vessel, out-houses for the use of patients; these contain four bath-rooms, ten wash-basins, eight water-closets, four latrines or sinks, and two urinals. One hot-closet or hot carving-table (Fig. 4) is fitted up and heated by steam, in each of the end upper wards; this is to keep the food warm for the patients. A scullery is also fitted up in each of the end wards for washing up dishes after meals.

The upper hospital wards are built with coamings of plate-iron 15 inches by ½-inch, rivetted to an iron deck, which covers the lower hospital (Fig. 7). Frames of angle-iron are rivetted at regular intervals to this coaming; they stand up 13 feet. The roof principals spring from this height, and they are also made of angle-iron. The sides, ends, and roofs are planked with yellow deal horizontally. The sides and ends have also a cross-lining on the outside of American yellow pine, making the thickness 2¼ inches. The roofs are covered all with 6-pound lead, instead of cross-lined with yellow pine.

The lower wards of the hospital-ship are five in number (Fig. 3), and are arranged to make use of the iron bulkheads that are fixed across the two vessels, binding the hulls together. These divided the "*Castalia*" into first and second saloons, etc., for passengers. The sides and ends of the lower wards are made of iron plate; the upper deck which forms the roof is plated all over with iron plating and covered with 2½-inch pine deck-planks, caulked water-tight. The lower wards are thus really cased with iron. They are similarly supplied with lavatories, hot-closets, and sculleries, as the upper wards; two skylights are provided in each ward to assist in giving light from above. The windows are all made as large as possible; they are 3 feet 6 inches by 2 feet 6 inches, divided into three sashes, similar to the upper windows.

The means of ventilation are, of course, much greater in the lower wards than the upper ones; the lower wards being much larger and not so high in the roof, the height from deck to deck being 8 feet.

At both ends of the lower and upper wards large isolating wards are fitted up. These rooms are provided for the purpose of isolating patients who may have been sent under the mistake that they are suffering from small-pox, and who prove, when examined at the ship by the medical staff, to be affected with measles, fever, etc. Every care is taken that patients with other diseases than small-pox shall not come into contact with any small-pox patients.

The patients are brought to the hospital-ship by the ambulance-steamers and are taken first into the reception-room and are examined, and are then allotted to the wards by the resident doctor. The separation of the sexes is rigidly enforced. The "*Atlas*" is now kept as a female hospital and the "*Castalia*" has been made a male hospital. The whole of the "*Castalia*" has been painted with Griffith's white paint and the Sanitary Company's enamel paint; every precaution has been taken, by painting, to prevent the germs of this disease from getting into the wood-work. Mr. Wythe, of Dalston, executed the paint-work. Messrs. R. and H. Green were the contractors to convert the "*Castalia*" into a hospital-ship. Messrs. Jas. Patterson & Co., of Ratcliff Engine Works, Stepney, supplied and fitted up all the machinery and pipes for the air-blast and the pumps for throwing water, for the water-closets, washing decks, fire-hose, etc. The engines are of the compound type, with cylinders 10 inches and 20 inches respectively, with a stroke of 2 feet. They are constructed to drive the Schiele's fan, and also a dynamo-machine for the electric lighting if required.

Very great attention and care was given to the ventilation of the hospitals. Professor F. de Chaumont, Dr. Bridges, Surgeon-General Bostock, and Mr. Barrington-Kenneth discussed the matter fully and arranged that Boyle's air-pump ventilators should be adopted. They also fixed the dimensions of these ventilators for the several wards according to the space to be relieved. The ventilators were tested one day during a smart breeze, and the speed, registered according to three anemometers placed in the ventilators, was at the rate of five hundred feet per minute, giving 50 per cent of the speed of the wind blowing outside, so that the atmosphere in the hospitals may be changed many times in an hour. Dr. Birdwood has since found that he can raise or lower the temperature in a few minutes, and he has caused the wards (when empty) to be filled with smoke by burning greasy waste, brown paper, cayenne pepper, etc. The fan blowers were put on, and in from three to four minutes all the smoke was cleared off.

The ventilators were made each with heads 6 feet in diameter, and were fitted with pipes varying from 3 feet 9 inches to 2 feet 6 inches in diameter. The lower wards have two ventilators of 3 feet 9 inches and eight of 3 feet 3 inches. The upper wards have four ventilators of 3 feet and six of 2 feet 6 inches. The lavatories and isolating-rooms have sixteen ventilators of 16 inches diameter. The cubical contents of the lower hospital are 73,465 feet; the superficial area, 9,308 feet; the window opening, 984.44 square feet. The cubical contents of the upper hospital are 84,607 feet; the superficial square area, 6,054 feet; the window opening, 1,792.52 square feet.

To provide for the satisfactory embarkation of passengers, piers are provided at various points by which they can be transferred from the ambulance to the steamer free from contact with the public. The first of these is the Longreach pier, which is erected close to the hospital-ships lying off Purfleet at Longreach. The patients embark and disembark to and from the ambulance-steamers, and to the hospital-ships, as may be arranged. The pier also accommodates the laundry staff in going and returning to their work from the staff-ship "*Endymion*." It is 193 feet in length over all; the moving portion is 125 feet long, the fixed part is 68 feet in length. The pier is lined throughout with yellow pine, and roofed over with glass, so as to keep the patients and others from getting wet. The moving portion of the pier rests at one end on a pontoon, which rises and falls with the tide; the other end is fixed to a stack of piles by a joint bolted to each of the girders, and also securely bolted on the piles. The fixed portion of the pier is also bolted to the same joint, thus making the connection of the moving and fixed parts. The pier is made so that ambulances may be taken down or up, with or without the horses. A porch has been built upon the pontoon; it is fitted with a waiting-room, stove, water-closet, urinal, etc.

A similar porch with conveniences is erected at the land end of the pier. The ambulances drive into this porch to take in or discharge patients under cover. The Rotherhithe Pier at Acorn Wharf is of similar design and accommodation, but is not roofed in. The length of Acorn Pier is two fixed spans each of 84 feet, and one moving span of 125 feet, in all 293 feet. The contractor for both piers is Mr. S. Chafen, Albion Street, Rotherhithe. This pier at Acorn Wharf is for the accommodation of patients living in the southeastern districts.

There is a pier building for Blackwall at Brown's wharf for the accommodation of patients living at the east end of London. This pier will only consist of a moving part of 125 feet in length, resting on a pontoon similar to the other in accommodations, etc. The wharf at which this pier is to be attached will be roofed in so that all the ambulances may be accommodated on the wharf, and shut in from the street, and that the public may be kept clear.

The fourth pier is to be erected close to Wandsworth Bridge; it is to be for the accommodation of patients in that district. This pier will be similar to Blackwall Pier. These piers have been designed by Mr. Adam Miller, and are being erected under his superintendence. The "*Endymion*" and the "*Castalia*" are connected by a covered gallery which will allow a certain relative motion of the two vessels.

There are, in connection with the "*Castalia*," three steamers for the ambulance service, viz., "*Red Cross*," "*Albert Victor*," and "*Maltese Cross*." The latest, the "*Maltese Cross*," built by Messrs. Edwards & Symes, Cubitt Town, E., is designed with two hospitals, viz., one aft and one forward, and is made to carry twice as many patients as the first steamer, "*Red Cross*," constructed by the same builders. The dimensions of this steamer are as follows: Length, 132 feet; breadth, 16 feet 6 inches; depth, 7 feet 6 inches. The engines are of the oscillating type, with cylinders of 23 inches diameter, with 30-inch stroke, steam pressure of 40 pounds.

The hospital arrangements for the patients in the matter of beds and conveniences, ventilation, etc., have been carried out to the instructions of Surgeon-General Bostock, who has taken a great interest in all the ambulance arrangements. The accommodation for the crew is put forward. The captain and medical officer are placed on deck abaft the boiler casing. The nurses have a berth in each hospital; a store-room is made under deck, right aft the transom, for medical comfort. Filtered-water cisterns are placed on deck at each entrance to the hospitals; a galley, with a cooking range, is fitted at one of the wings of the paddle-boxes, so that in the event of the ambulance-steamer being delayed by fog in the river the patients would have the same comfort as in the hospital proper.

The ambulance-steamers have also been designed by Mr. Adam Miller, and the "*Albert Victor*" has also been converted by him into an ambulance-steamer. — *Engineering.*

ROOFING-TILES.



COMPETITION FOR EQUESTRIAN STATUES FOR BLACKFRIARS BRIDGE, LONDON. DESIGN BY R. BELT, SCULPTOR.

THERE is no way to tell exactly at what time the art of making roofing-tiles was revived in England. But as the buildings of the Anglo-Saxons were usually of wood, rarely of stone until the eleventh century, and as the first instance of a modern or Flemish brick building in England does not occur until after the first half of the thirteenth century, it is not probable that roofing-tiles were made prior to building bricks.

We have been making building bricks extensively in the United States for more than three-quarters of a century; but it is only within the past few years that we have accomplished anything in the line of manufacturing roofing-tiles. The following statement in this connection is, of course, purely hypothetical; but we probably state the truth when we say that England has probably never discounted us, and made roofing-tiles before she made building bricks.

In 1784, tiles as well as bricks were subjected to taxation by George III, which burden lasted for two-thirds of a century, not being repealed until 1850.

The plain tiles now in general use in England weigh from two to two-and-one-half pounds each, and expose about one-half their surface to the weather, four hundred of them covering "a square," or one hundred superficial feet of roof-surface; they are sometimes hung upon the sheathing-board by two oak pins inserted through holes left by the moulder. Plain tiles are also now made with grooves and fillets on the edges, so that they can be laid without overlapping the usual distance, the grooves leading the water. This may answer for some cheap constructions where lightness is also a consideration; but the plan is a bad one, as they will be certain to leak in the driving rains and drifting snows, and they are also, if not very thoroughly burned, subject to injury by hard frosts.

Pantiles were first used in Flanders, the wavy surface lapping under and being overlapped by the adjacent tiles. The English pantiles weigh from five to five-and-one-quarter pounds, expose ten inches to the weather, and one hundred and seventy-five of them cover a square, or one hundred superficial feet of roof-surface. Modifications of the pantiles have been made in which the central portion is flat, and the edges turn up and down respectively.

In England a gutter-tile is sometimes used, and forms the lower course, overhanging the lower sheathing board or lath, and is nailed to it.

Sliding-tiles are used in this country and in Europe sometimes, as a substitute for weather-boarding; holes are made in the tiles during moulding, and they are secured by flat-headed nails to the lath. The exposed face of these tiles, called the gauge, is sometimes indented to represent courses of brick; fine lime mortar is introduced between them, when they rest one upon the other. Tiles of this character are sometimes called weather-tiles, and sometimes mathematical-tiles, the names being derived from their exposure or marking. They have a great variety of forms, having curved or crenated edges, and are also variously ornamented with raised or encaustic figures.

Roofing-tiles were probably used in Normandy before being employed in England, as the latter country always followed in the wake of its more energetic neighbors in all matters relating to architectural progress. All the rich Norman mouldings were copied by the English, and, as a great part of the knowledge of the art of manufacturing decorative tiles was derived from the Normans, it is not improbable that they are also indebted to them for a knowledge of the manufacture of roofing-tiles. The Normans were an active race, and delighted in building; to dwell in and constantly beautify their magnificent castles seems to have been the delight and greatest pleasure of their princes and nobles. But of course no credit is due to the Normans, for having originated the use of roofing-tiles, as they had been employed in the East, and the art of their manufacture was borrowed by the Crusaders. The highly ornamental buildings of Byzantium, Palestine, and Syria, were very attractive to the Crusaders, and as many of the early Norman roofing-tiles correspond with features of Byzantine architecture, the analogy is a corroboration of the statement previously made.

When roof-tiles are to be glazed, they are sometimes varnished after being burned; the glaze is then put on, and the tiles are placed in a potter's oven, and remain until the glaze commences to run. The glaze is usually made from what we call lead ashes, being lead melted, and stirred with a ladle till it is reduced to ashes or dross, which is then sifted and the refuse ground on a stone and resifted. This is mixed with pounded calcined flints. Manganese is sometimes employed to produce a glaze, which is usually of a smoke-brown color. Iron-filings are also used for producing a black color; for green, copper slag; and for blue, smalt is employed, the tile being first wetted, and the composition laid on from a sieve. Cheap salt glaze can also be applied to tiles in the same manner as for earthenware sewer-pipes.

Before proceeding to describe the method of manufacturing roofing-tiles we will first consider some of the advantages which accrue from their employment. Tiles when well made and thoroughly burned are indestructible, and are not affected by heat and cold. They will not crack and slide off the roof like slate, leaving the sheathing exposed, when subjected to sudden heat, as by the burning of an adjoining building. In addition to the fact that after doing service on one structure the tile can be taken off, and used on other buildings, there is the picturesque appearance which modern tile-covered roofs add to the architectural effect. Another great advantage for the tile-roof is that it is a non-conductor, and, therefore, cooler in the summer season than other roofs; the buff tile being lighter in color is preferable in the latter respect, as it does not absorb the rays of the sun. A final advantage which, although we mention it last, is of paramount importance where cisterns are employed, is that the rain-water collected from a tile-roof is much purer and more healthful than from any other kind of roof, as the tiles are very smooth, and no dust or soot settles upon them.

Objections to roofing-tiles in this country, have heretofore been made to the effect that the tile was heavy, made of coarse clay, poorly burned, and that it would absorb a great amount of moisture, so that freezing and thawing would cause it to crumble, and in appearance, it was anything but handsome. Whatever foundation these objections may have had in the first product of tiles, our manufacturers have now fully met and remedied these drawbacks to their use.

Tiles should not be put upon a roof that has less than one-quarter pitch (a slant of six inches to the foot), although we have seen some roofs of less pitch which have proved quite satisfactory. A roof to support tile should be somewhat stronger than for shingles. Rafters 2″ x 6″, spaced 18 inches apart and well stayed so that they cannot spread, form a good frame. The sheathing should be of white-pine, of even thickness, and close together. Generally, felt or tarred paper is placed under the tile, although it is not necessary to make the roof water-tight, but it impedes circulation and makes the roof warmer in winter, and adds but little to the cost.

When the process of manufacturing roofing-tiles is conducted by hand, the method is about the same in the United States as in England, and but few improvements have been made in this mode of production during the past century, but by the machine process we are enabled to manufacture very satisfactory roofing-tiles at but a small cost when compared with the hand method of moulding. The clay of which the tiles are made is dug and spread out in shallow beds to disintegrate during the winter season, the water contained in the clay expanding and breaking it in every direction. At one time very inferior roof-tiles were made in England, on account of the careless weathering or preparation of the clay employed; and in order to cure this, a statute of Edward IV required that all clay for tiles should be dug or cast up before the first of November, and not made into tiles before the March following. Sometimes when the clay has not been exposed to the frost it can be disintegrated by spreading it out in thin layers, and exposing it to a hot sun.

Iron rolls are often employed to disintegrate the clay, and crush or separate from it all stones and gravel. The clay must next be tempered, that is, reduced to a homogeneous and plastic mass. The usual form of pug-mill employed in England for tempering clay for roofing-tiles is generally six feet high, three feet in diameter at the larger or upper end, and two feet at the bottom. The clay is kneaded and thoroughly mixed by a revolving cast-iron spindle, which carries a series of flat steel arms, so arranged as to have by rotation a worm-like action upon the clay, which is pressed from the larger to the smaller diameter of the tub in which the clay is confined, and finally comes oozing out of an aperture at the bottom; in this manner of

tempering, great cohesive power is given to the clay. After it issues from the bottom of the pug-mill, the clay is usually ready to be moulded into roofing-tiles, the moulding is commonly conducted in a shed, and most of the manufacturers prefer to place their tiles in the open air, if the weather allows.

The moulding-table or bench upon which the tiles are shaped is supported on four legs, which are placed well under the bench, leaving the two ends of the top of the table to project liberally. The coal-dust box 14″ x 8″, is at the left hand of the moulder, resting on the corner of the table, and the moulding-board, 14″ x 10″, is usually placed slightly to the right of the coal-dust box. The mould employed is 12″ x 7¾″, and one-half inch thick, made of oak, and usually plated with iron. The moulder, when he wishes to form a tile, works a lump of clay with his hands into an oblong square, the mould is placed on the bench, and fine coal-dust sprinkled over it; the lump of clay is then taken up and dashed down into the mould with force, the surplus clay is cut off level with the top of the mould by a brass wire strained upon a wooden bow, and the tile in the mould is finished by adding a little clay to it, if necessary, and smoothing the exposed face with a wooden tool. The moulded tile is then placed upon a thin board, first sprinkled with very fine coal-dust, and so the process is repeated, the lump of clay being added to, every time six tiles are moulded.

The boy or off-bearer carries two tiles at a time, one on his head, and one on his hands to the floor, where they are allowed to remain for four hours out of doors in fair weather, and then collected and placed together, the nib end changed alternately, so as to hack them closely and squarely. The situation of this hacking should be dry, but not hot, and the tiles remain hacked for two days, so as to allow them to toughen.

The set or curve form is then given by placing six of the tiles at one time on the top of the horse, which is a three-legged stool, having the top about three-quarters of an inch longer than the tile, the top being a convex curve to a radius of about ten feet and three inches, and having a height of about two feet and seven inches from the level of the ground. In placing the tiles on top of the horse, the nib end is reversed each time, and as they lie closely together, three quick blows are given to the tiles with a block, which is concave, so as to correspond with the convexity of the horse. The tiles are then again hacked and dried, and next carried to the oven, twelve at a time, with the edges of the tiles resting against the breast of the carrier.

About nine thousand tiles are commonly burned at one time, when the old-fashioned Staffordshire oven is employed; but with larger kilns the quantity of course can be increased. The time required to burn the small ovens of tiles is usually about from thirty-six to forty hours.

The manufacture of plain roofing-tiles such as we have described, can be conducted with a small capital, the process and requirements not being intricate or expensive. But to conduct the manufacture of all the tiles required for roofing, and the numerous other articles generally made in large tileries requires a large capital, and a thorough knowledge of the business in all its details. To faithfully describe the manufacture of all the articles produced in extensive tileries would increase this paper to such an extent as to fill a large volume; the principle of procedure is the same in each case, but no two different articles are made or finished in a similar way, each requiring different tools and moulds.

In the London tileries, which are the largest in the world, there is paid particular attention to the proper preparation of the clay for the particular purpose for which it is to be used; there not being the same haste to get the clay into the kiln that is so often shown by some of the smaller manufacturers. The first step in preparing the clay in the London tileries is the weathering, which is accomplished by throwing the clay into pits covered with water, and leaving it to soften or ripen. The clay is then usually passed through the rollers, and the stones taken out before it is put into soak, which is a term also used for the mellowing process. The kilns used for burning the wares produced in these extensive London tileries are usually conical in shape for more than one-half the height, about forty feet wide at the base, and have a total height of about twenty-five feet from the bottom of the ash-pit to the top of the dome, which is slightly convex. These kilns are quite expensive to construct, eight thousand dollars being about a fair average cost, as fire-bricks of the best quality are largely employed in the interiors.

The manufacture of roofing-tiles is a comparative new industry in the United States; but it is one which is now rapidly growing in public favor. With us, the tiles are usually of three colors, red, buff, and black. The color of the red tile is produced by the employment of clay containing a large per centage of oxide of iron; this is sometimes present in the beds with fire-clays, which are the class usually employed for roofing-tiles; at other times, it is necessary to mix some foreign clay, containing a large percentage of oxide of iron with the material. The color is made deeper and more uniform by rubbing the tiles with finely-sifted red moulding-sand; this should be done while the tile is quite damp, so that the sand can be made to adhere to the tile. The buff-colored tile is made of nearly pure fire-clay, and is slightly lighter in weight than the red tile. The black-colored tile is produced by washing it over with manganese dissolved in water before the tile is placed in the kiln, and in the process of burning the manganese is converted into a perfectly durable coating of great hardness.

The small diamond tiles are 6″ x 10″, require 500 to cover a "square," and weigh 600 pounds. They are nailed to the sheathing with two five-penny galvanized nails, and are used more especially for towers, porches, dormer-windows, and in side panels for ornamental purposes.

Large diamond tiles are 14″ x 8½″, 250 cover a "square," and weigh 650 pounds. Two six-penny galvanized nails are used to secure it to the sheathing. This kind of tile is used more than the other forms for regular roofs, as it is lighter in weight, and less in cost.

The shingle tiles are the plain flat tiles, the manufacture of which we have described in this paper; after burning they are three-eighths of an inch thick, have two counter-sunk nail holes, and can be made of any required size not exceeding 6″ x 12″; they can be obtained from the manufacturers, who keep them in stock. Tiles have been largely employed in the Eastern States, and on some expensive buildings for roofing and side ornamentation, as at the State Capitol at Albany, N. Y., on which building they are secured with copper wire to iron ribs. Tiles of this kind are generally laid so as to expose about five inches to the weather, which require 480 to a "square," the weight being about 1100 pounds.

The pantiles measure twelve inches in length, by six-and-one-half inches in width at one end, and four-and-one-half inches at the other, and if they are lapped three-and-one-half inches on the roof, 350 will be required for a "square," which will weigh 850 pounds. This kind of tile makes a strong roof cover, and can be walked upon without danger of breaking, and it is especially suitable for workshops and factories; it is sometimes made with lugs to hang on to ribs, the use of nails being thereby avoided, which is desirable, as nails are liable to rust away where much bituminous coal is used. But the tiles are also made with nail holes to secure them to the sheathing-boards, as for private dwellings, etc.

The varieties of tiles which we have just described are made at Akron, O., in large quantities, and are shipped to all parts of the United States. In England and other portions of Europe roofing-tiles are mostly made by the hand method; but in our country they are almost entirely produced by machinery.

The crestings and finials used with tile require artistic treatment, and are generally made by manufacturers of terra-cotta.

Charles T. Davis.

THE ILLUSTRATIONS.

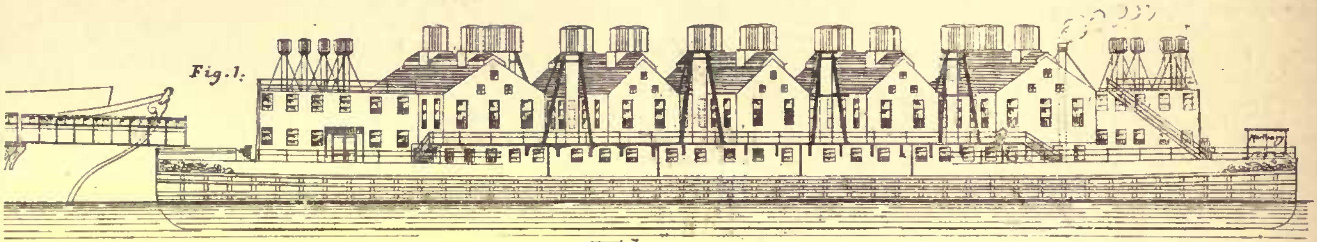
NEW BUILDING FOR THE INSANE, CONCORD, N. H. MESSRS. RAND & TAYLOR, ARCHITECTS, BOSTON, MASS.

THE trustees of the New Hampshire Asylum, having long felt the need of a building for a certain class of patients, in which their surroundings may be as much as possible like those in a quiet, well-ordered home, have been the first within our knowledge to carry their ideas into effect, in a building shown in the accompanying illustration. It is called the "Bancroft Building," in compliment to Dr. J. P. Bancroft, superintendent of the asylum for more than twenty-five years. In the planning of the building the idea has been to avoid all appearance of restraint, as well as everything to remind one of the ordinary hospital ward. There are fireplaces, open stairways and bay-windows, and a home-like, domestic look in all the arrangements. All rooms for patients face to the south, east or west, the north side being occupied by the stairways, storage-closets, etc. Each patient has a parlor with a bay-window, a bedroom, and a water-closet. The general sitting-room runs across the entire width of the building. It has a large octagonal end to the south, and two fireplaces. Every room is heated by indirect steam, and has two ventilating flues, the flues being built in the partition walls, which are all of brick. The outside walls are hollow, so that no wooden furrings or lath are required. Connection with the main building of the asylum is obtained by a corridor about one hundred and fifty feet long, on the east side of which it is planned to build the special dining-rooms, serving-rooms, etc., the food-supplies coming from the general kitchen. The exterior shows a granite underpinning and brick walls. Terra-cotta and moulded brick are used to some extent, the latter being made at the local yard which furnished the other bricks. The roofs are slated, and there are no gutters except on the porch roof. The cost of the building was $37,000. It has been built by the day, in the most thorough and careful manner; the sanitary appointments especially have been studied and executed with great care. The decorations and furnishings of the rooms have been done so as to enhance still further their home-like effect. The walls and ceilings are all harmoniously painted, each suite being different from the others.

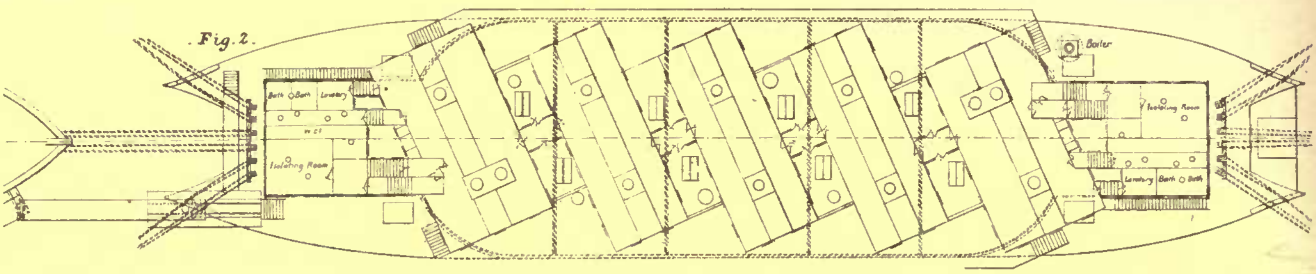
A MONUMENT TO MUNICIPAL FOLLY: — A DRINKING-FOUNTAIN ON BOSTON COMMON.

Apropos of the drinking fountain which has been accepted by the Boston City Government, at the hands of a San Francisco cold-water enthusiast, and set up in a conspicuous position on the Tremont Street Mall, the Boston *Evening Record* offers the following fable: —

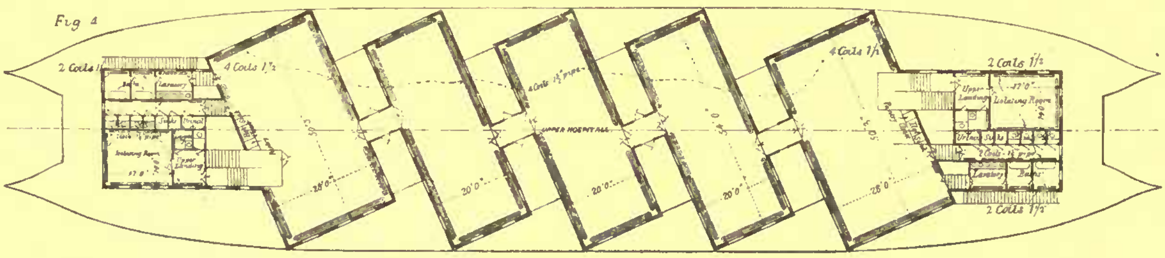
A Frog-Pond, rubbing its Eyes with Amazement, one morning saw an intrusive Drinking-Fountain near at hand. Accustomed only to the Best Society, the Frog-Pond cried out: "Who are you, and what are your intentions?" A Marble Smile played over the Fountain's Pacific Features as it replied: "I am engaged by the Year, as a Protest against



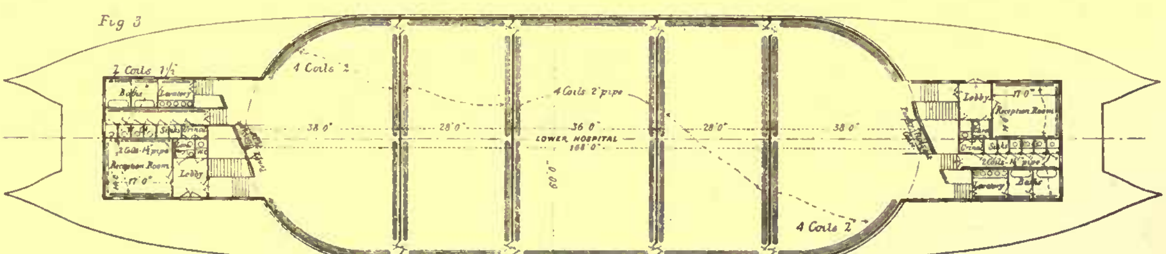
Elevation



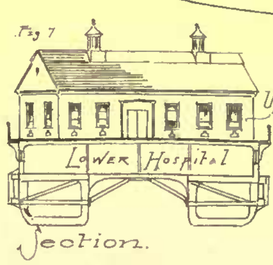
Roof Plan



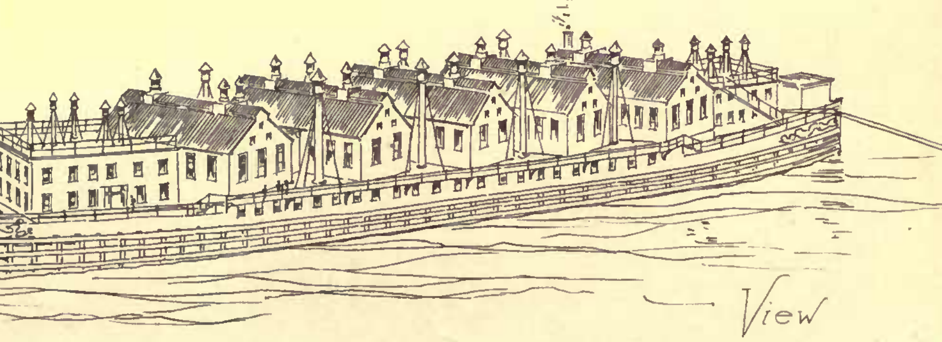
Plan of Upper Hospitals



Plan of Lower Hospital



Section.



View

The "Castalia" Hospital Ship, London, Eng. MR. ADAM MILLER, ENGINEER.

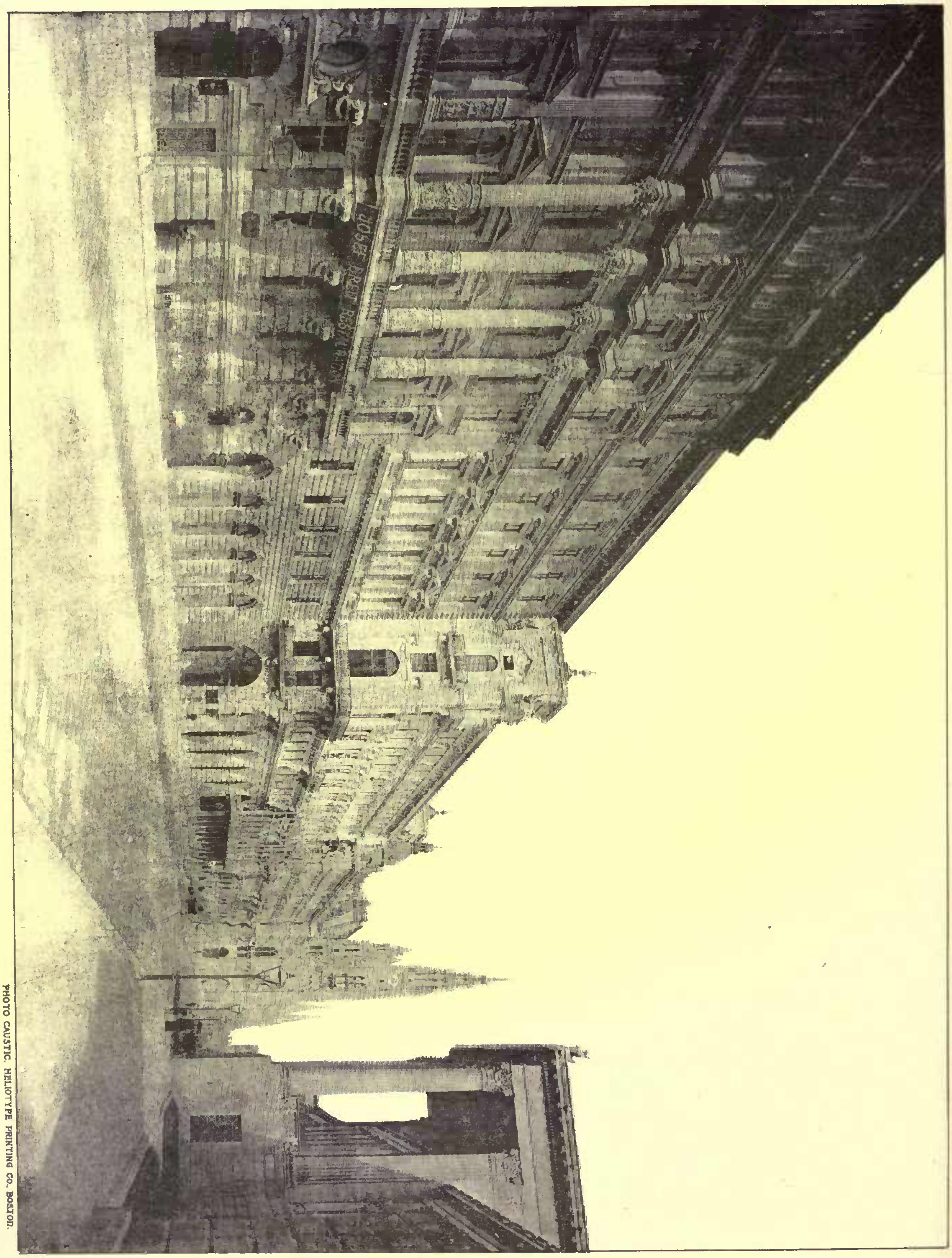
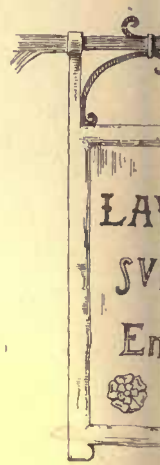


PHOTO CAUSTIC. HELIOTYPE PRINTING CO. BOSTON.

A Street View, Vienna, Austria.



c
a street in Lavenham





The Village Crofs



d



[J. R. O]SGOOD & CO





"b"

The main street

From a water-color sketch by A.K.B -'83



"e"

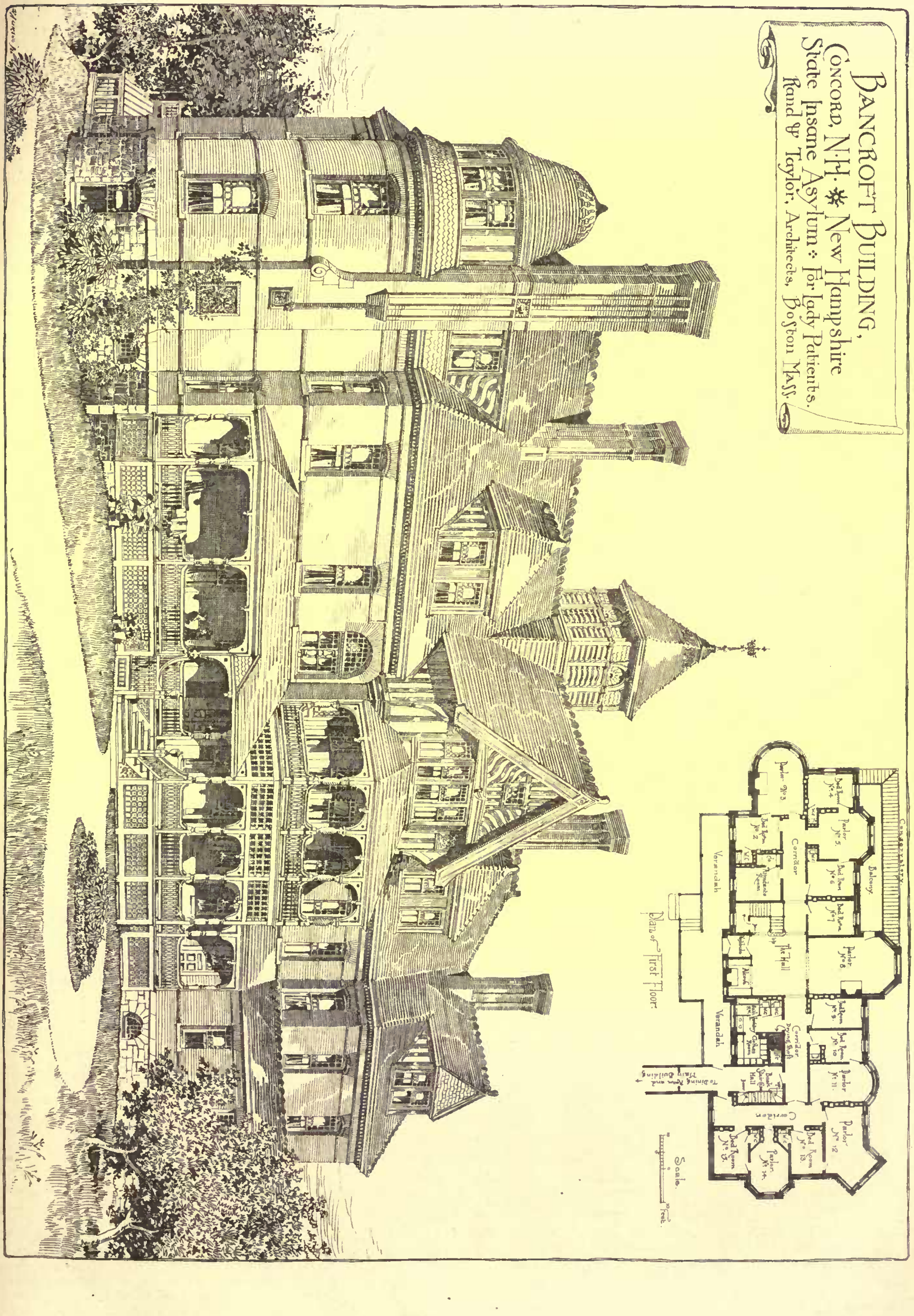


"a"



PHOTO CAUSTIC, HELIOTYPE PRINTING CO., BOSTON.

A Monument to Municipal Folly.
The new Drinking Fountain on Boston Common.



HELIOTYPE PRINTING CO. BOSTON

Pure Art." Whereupon the Pond remarked; "Seeing you are merely an Awful Example, perhaps you may Stay."

Moral: Repulsive-looking strangers should be treated with Courtesy, for their Ugliness may be useful in making your Comeliness more Obvious.

This fable and the illustration we publish mutually explain each other so effectually, that we trust that other City Governments to whom similar gifts are now being offered, will see the wisdom in declining them "with thanks."

THE "CASTALIA." HOSPITAL-SHIP ON THE THAMES, LONDON.

FOR description, see article elsewhere.

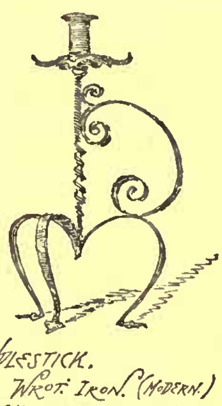
SKETCHES AT LAVENHAM, ENGLAND.

SEE article on "Old Colonial *vs.* Old English Houses."

A STREET VIEW IN VIENNA, AUSTRIA, IN 1884.

THE spire of the Votiv Kirche shows dimly in the distance, the spires in the middle distance belonging to the new City Hall. The rear of the Rathhaus shows in front on the right, and the buildings on the left are some of the apartment-houses for which Vienna is celebrated.

THE ELECTRICAL EXHIBITION AT BOSTON.



THE American Electrical Exhibition now open in the building of the Massachusetts Charitable Mechanic Association, though perhaps not as complete in all its details as one could wish, is well worth a short visit by any one who is interested to note the progress which electrical science has made in the last few years. The electric-light systems shown there are thoroughly representative of the advancement which this branch of the science has made in the last few years. The writer remembers, at an exhibition of the Massachusetts Charitable Mechanic Association, held, unless he mistakes, six years ago, the Wallace-Farmer arc lamp, which was then held to be one of the best arc lamps made, and the contrast between the jumping, changing, and altogether erratic light from them and the steady, clear, colorless light from the carbon pencils of the improved arc lamps in the exhibition to-day, is but a feeble indication of the improvements made in electric lighting in various directions.

Among the various ingenious pieces of mechanism shown at this exhibition, perhaps the one which attracts the most attention is the electric railway system which has its track extending around the gallery. It embraces more than is apparent at a first glance, for the pair of conductors which extends around the gallery, inside the rails on which the cars run, carries electricity not merely for turning the motor by which the cars are driven, but also to furnish light for the cars, heat for them, if it is desired, and light for various points along and around the route. The way in which the conductors are run separate from the rail and thoroughly insulated on their supports allows the use of a current of electricity of rather high pressure, or tension, as it is usually termed, and by this means the use of the current for various forms of work is possible even at a considerable distance from the point at which the dynamo-generators and engines are situated: in this particular instance they are about half a mile from the exhibition-building, and would undoubtedly work equally well were they placed at twice or even four times the distance. As the use of electric motors for propelling cars, both on surface and elevated roads, is attracting much attention, it is interesting to observe how easily the current acting on the motor, which is capable of drawing forty-five persons round a curve of only twenty-five feet radius, is controlled by the attendant in charge, and how readily the current can be made to act as a powerful brake on the cars, by a movement of a small switch, very different from the massive lever and connections used to reverse the direction of a locomotive steam-engine. The absence of dirt, noise, smoke and escaping steam is very attractive when one thinks of the progress of a train on the elevated roads in New York, and one rejoices to think that there is even a possibility of a change to such a motor as is here shown.

The electric lights are the most noticeable parts of the exhibits on the floor of the building, and the possibilities of ornamental work in this direction are well suggested by the combinations of lamps and globes of various sizes, shapes and colors, in chandeliers, large and small, and single fixtures in all sorts of places and positions. The Edison Company has a very complete display of the fittings used by them in their work, both in buildings and for carrying their wires through the streets, and the ingenuity displayed in overcoming the various obstacles which have presented themselves is worthy of great commendation. Besides these, they have a large number of incandescent lamps, lighted every evening from the 250-light dynamo situated in the basement and driven by one of the small, high-speed steam-engines which have been found most satisfactory for this class of work.

The N. E. Weston Electric-Light Company also has a large number of lights throughout the building, part of which are supplied by dynamos situated in the basement of the building, and part from dynamos in the factory on Stanhope Street. From this factory also comes the current for the railway around the gallery. This Company has three kinds of lamps on exhibition: their arc lamps, which are too well known to need description; their small incandescent lamps, giving a light equivalent to sixteen standard candles each; and their large incandescent lamps, giving a light equivalent to one hundred and twenty-five standard candles each. These last have but recently been introduced, and seem likely to be of use in lighting large spaces when a steadier light is needed than is given by any of the arc lights now in use. The Weston Company has also several motors in different parts of the building, varying in capacity from one to five horse-power, and used for running a printing-press and other machinery of different kinds, some requiring considerable power, and others very little, thus showing the applicability of electric motors to almost any work not requiring over ten-horse power. There are also in the exhibition several smaller motors, of proper size for running a sewing-machine or jeweller's lathe, for which current is supplied by the Weston dynamos, and the application of one of these to running a model of a passenger-elevator suggests the possibility of applying the larger sizes to running elevators for actual work in buildings near the wires conducting the electric-lighting currents in our cities.

Opposite the exhibit of materials of the Edison Company are some of the first fire-alarm instruments used in the city of Boston, there being both the boxes for sending the signal to the headquarters of the department, from the vicinity of the fire, and the apparatus for striking the number of this box on the bells through the city. As we compare the magneto generator used for this purpose in those times with the perfected apparatus now in use in the tower of City-Hall, we wonder that a successful system was ever developed from such beginnings, and admire the persistence of Messrs. Channing and Farmer, who developed the system to something like its present perfection. In the gallery we find two systems of fire-alarm in which the heat of the fire itself gives notice of its existence, and, by ingenious devices, gives further notice at any desired point of the location of the flames. These systems are both the result of close study of the needs in this direction, and seem likely, if at all generally used, to lessen the enormous fire-loss. One of these systems is combined with a watchman's-clock: the same wires are used for the registering apparatus for the watchman and the little "thermostats" which close the circuit and give the alarm in case of fire, thus making double use of them, and securing nightly testing of the completeness of the circuit and battery. There are also two other watchman's-clocks exhibited in different parts of the building, one of which is so arranged that if the watchman fails to do his duty by going to each of the prescribed stations in the building within a given time, an alarm is given at any point desired within a mile or two of the building, thus giving additional assurance of the safety of the premises.

In another part of the gallery is an ingenious system of railroad signals, in which notice of any occurrence likely to cause an accident is given not only by colored signals or lights near the track, but also by ringing a bell in the cab of the locomotive approaching the place. The arrangement of circuits, bells, and batteries in these devices is very ingenious, and worth some study on the part of any one interested in such matters.

The display of the Bell Telephone Company is interesting chiefly from an historical point as their collection of the different kinds of telephone transmitters and receivers, and the different forms of calls used up to the present time in their many "central offices," is very complete. There is also on exhibition, in working order, one of Mr. Edison's chalk-cylinder receivers, commonly known as the "motophone" or "motograph," an instrument which actually reproduces the vibration caused by the voice louder than they were spoken into the transmitter at the other end of the line. The difficulty about the use of this instrument is the necessity of frequently moistening the cylinder with dilute sulphuric acid, and of frequently adjusting the point which rests on the cylinder and transmits the vibrations to the diaphragm of the instrument. They have also a set of telephone instruments, which can be attached either to the transmitter, which they have placed in the Bijou Theatre, or to the metallic circuit line which they have built to New York, and over which conversation is readily carried on many times a day; the instruments in New York are in Mr. Edison's laboratory on Fifth Avenue, and any one who desires may have the opportunity of talking without difficulty with a person two hundred and fifty miles away. Mr. Edison has on exhibition a large number of his inventions in telegraphic work, among which are his last "quadruplex" instruments, which are now the standard instruments used by the Western Union Telegraph Company, and his instrument for automatically reproducing a drawing or writing made by a specially-arranged pen, at the other end of a telegraph line. This instrument proved too delicate for ordinary commercial work, but with careful adjustment can be made to reproduce the movement of the pen with great fidelity.

Two systems of conduits for electric wires are shown, both of which are intended to be placed along the curb of the roadway, and to form part of it, and are largely constructed of iron. One of them at least seems as if it might prove to be a practical system, and may be of

assistance in ridding our roofs and streets of the poles and wires which at present so disfigure them. There are also a large number of the various electrical devices used so largely in houses, hotels, and other buildings, such as call-bells, with the knobs for ringing them, electric gas-lighters, and burglar-alarms. Among these may be mentioned the electric gong and apparatus for striking it, used by several of our railroads for giving the signal for starting trains; this can be made to strike the gong automatically at the proper minutes during a whole day, being controlled by a drum set with pins, which is driven by impulses from the clock at the Observatory in Cambridge.

There is also a set of telephone instruments to which is attached a device for automatically showing whether the line on which the instruments are placed, is in use or not. There is also a set of the instruments used by the Oram Time-Repeater Company, for indicating in the telephones of any central office the beginning of each minute throughout the day.

The miniature theatre, lighted by incandescent lights, and around which are telephone receivers attached to the transmitter at the Bijou Theatre, attracts a great deal of attention during the hours when the play is going on at that theatre, and is really a very pretty and attractive sight during the evening.

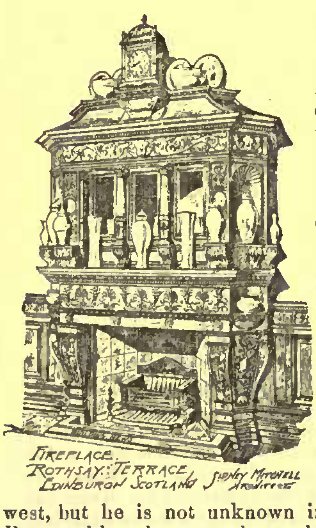
The exhibition of the working of an ocean cable is shown very completely in the little tent arranged by the cable company. They use both the flash of light by which all messages were sent until recently, and Sir William Thomson's "siphon recorder," which is a very fine glass tube, drawn to a point and filled with ink. A roll of paper is drawn under it, and the right and left movement of the point produces a wavy line in which the height of the undulations determine the nature of the signal sent.

There are also on the lower floor, two incubators or hatching machines, in which electric devices are used to control the heat supply, used to hatch the eggs; and with one of them there is also a similar arrangement for opening and closing the dampers of a heating-furnace, by a combination of clock work and electro-magnets, connected with a metallic thermometer, which closes either one of two circuits at any desired temperature, thus allowing the clock-work to open and close the dampers, and increase or diminish the draught.

The Consolidated Electric-Light Company of New York, has a pretty little cottage, which they intend to light with incandescent lamps very soon, and their dynamo-machine is now in position in the basement. Indeed, the dynamo-machines of all the lighting companies at the exhibition may be seen there in full operation at any time after dark. Taken as a whole, the exhibition is a good one, and shows forcibly the advance in electrical work during recent years.

F. Elliot Cabot.

LASGIRD, THE CURIOUS.

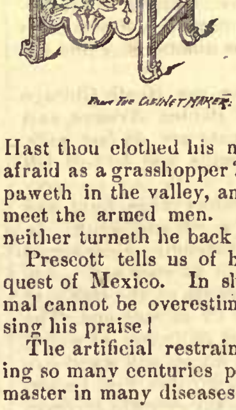


We had not proceeded far on our way when vestiges of the former condition of things met our eyes. It was at a place only one hundred miles from Teheran that we first realized the dreadful state of danger in which the people had lived. We found a most remarkable village at which we encamped. Supposing no information could have been procured, and an archæologist had come upon it by accident, he would have had a profound puzzle to unravel and explain. The name of the village is Lasgird. The people ascribe an immense antiquity to it, and say that Las, or Last, a son of Noah, drew on the ground the "gird," or circle, which is the plan of the structure. The hero of this legend is not very familiar to Biblical scholars in the west, but he is not unknown in Afghanistan. The Colosseum at Rome, although an oval, would convey some idea of the general appearance of Lasgird, only it must be conceived as built of mud, which is almost the only building material of this country. It should also be recollected that the one belongs to a period of good architecture, of which it is a celebrated monument, while the other may be said to be entirely destitute of any pretensions of this kind.

The rude mud walls are thick and solid all round at the base, and rise some thirty or forty feet, where there is a line of doors, with here and there a small window between them. By means of projecting beams, or branches of trees, over which smaller branches are laid, a kind of gallery is produced, bearing a strong resemblance to those simple forms of birds' nests which are formed of sticks placed on the upper branches of trees. The wonder is how the eggs do not roll over, or that the chicks do not tumble down to destruction. So it is with the galleries of Lasgird: there is no protection on the edge. Yet we saw women and children, sheep and goats upon them. A more frail and dangerous-looking arrangement it would be hard to conceive. There are two tiers of houses all round, and in some places there appeared to be three. All had these galleries in front, either to communicate with the next house, or, as some did not communicate, they were only of use to come out upon to sit or work, or for the children to play upon. To us these places seemed the brink of destruction, while to the women and children it all appeared as safe and comfortable as if they had been monkeys. Of course there was no getting up to these galleries from the outside; that would have suited the Turcomans. The means of going up was all on the inside. In some cases there are rough steps of mud, and in others there are inclined planes, half ladder and half road, made in the same way as the galleries. These lead up to galleries communicating with the houses, which were an exact repetition of those on the outside, the only difference being that they were not so high up, and there were walls at places which did duty as a parapet, hence the certainty of falling over did not seem quite so great from the inside as on the outside. While looking at this strange structure from one of these upper galleries, an old woman of at least seventy years of age passed me with a child stuck in some primitive way on her back. A few yards from me was one of these means of ascent, formed of sticks, with the remains of mud hanging to it; it would have done for fowls to go up to their roosts upon. She clambered up on this to the gallery above, but that was not her destination; her house was one up still higher in a corner, and to reach it she had to crawl up on the edge of a crumbling mud wall not above eighteen inches wide. On her left hand was a perpendicular descent, enough to make any one dizzy, and death at the bottom of it if a fall should occur; although on the other side there was only a few feet, if the old creature had slipped, the chances are she would have rolled down and fallen over the gallery with the baby on her back. The old lady went up very steadily, and reached her crow's nest in perfect safety. I could not help thinking that a few generations of this kind of thing would undo all our development, and that we would go back again to our original simian condition.

The dwellings of the people were all in the upper part of the great circle, and the centre was filled up with strange moss structures, which are now falling to decay, as there is no longer any danger from the Turcomans. These places were for containing the grain of the village, and for receiving the live stock of the villagers when a raid occurred. One of a number of wells was pointed out to us within the circle, and we were told that they had three or four which were always kept in good order in the days of danger. There is only one entrance to this circle, and that is by a small entrance scarcely four feet in height, to which there is a stone door working with a pivot and socket similar to the ancient stone doors found in the Hauran and other parts east of the Soudan. This stone door of Lasgird is a very rude one, being eight inches thick in some parts, and it tells its tale of the existence of great danger and the necessity for protection. Sir Peter Lumsden had a long conversation with the Khet Khodah and some of the principal villagers, and it seemed that they not only ascribed the origin of Lasgird to the son of Noah, "Nu," as they called him, but they likened their strange dwelling-place to the ark. Extreme theologians, who identify the church with the ark, say all who were in the ark were saved; all without were destroyed. This was exactly the case with Lasgird. When a chupao took place, all who got in were secure; all who were left outside became victims. A chronic state of war existed, and this fortified village was the result. The Government either could not or would not defend the people, and they had to take means for their own safety. — *Letter from Persia to the London Daily News.*

STABLE CONSTRUCTION.[1]



The United States Census of 1870, gave the number of horses owned in the United States, as 8,690,219. When the Census of 1880 was taken there were 12,-170,296 horses, mules, and asses on the farms alone. Our own State of Illinois leads with 1,146,360!

Anything affecting the monetary value of this vast multitude is of importance to the individual owner, to the State wherein he resides, to the nation of which he is a citizen!

We appeal in vain to history to inform us when mankind first subjected this, the most noble of the brute creation, to his service in times of peace, and times of war! The date is lost even to tradition, but that he served in the dawn of mankind, the sublime words of Job bear witness.

"Hast thou given the horse strength? Hast thou clothed his neck with thunder? Canst thou make him afraid as a grasshopper? The glory of his nostrils is terrible. He paweth in the valley, and rejoiceth in his strength; he goeth on to meet the armed men. He mocketh at fear, and is not affrighted; neither turneth he back from the sword."

Prescott tells us of his service with the Spaniards in their conquest of Mexico. In short, the debt of humanity to this noble animal cannot be overestimated, and every language has been used to sing his praise!

The artificial restraint imposed upon the horse by mankind during so many centuries past has had its effect, and he resembles his master in many diseases.

[1] A paper read July 15, 1881, by Augustine W. Wright, Member Western Society of Engineers.

From a sanitary point of view late years have witnessed great advancement in the construction of buildings for mankind, and the cry for better stable accommodations has not been uttered entirely in vain.

Permit me to quote a few from the many writers upon this important subject.

John Stewart wrote: "Stables have been in use for several hundred years. It might be expected that the experience of so many generations would have rendered them perfect. They are better than they were some time ago. . . . A damp stable produces more evil than a damp house. . . . Since 1788, when James Clarke's work was published protesting against close stables, there has been a constant outcry against hot, foul stables. Every veterinary writer who has had to treat of diseases has blamed the hot stables for producing at least one-half of them." Jennings wrote: "The most desirable thing in a stable is ventilation. A horse requires air equally with his master; and as the latter requires a chimney to his sleeping room, so does the former." Henry W. Herbert, better known as Frank Forrester, wrote: "In a climate so uncertain, changeful, and in which the extremes of heat and cold lie so far apart, as in this country, the question of stabling is one of paramount importance. The stable, to be of real utility, must be perfectly cool, airy, and pervious to the atmosphere in summer; perfectly close, warm, and free from all drafts of external air, except in so far as shall be needed for ventilation, in winter; perfectly ventilated, so as to be pure and free from ill odors, ammoniacal vapors and the like arising from the urine and excrement of the animals, at all times perfectly dry under foot, and well drained, since nothing is more injurious to the horse than to stand up to its heels in wet litter. . . . Lastly, it should be perfectly well lighted, as well as thoroughly aired."

Stonehenge wrote: "The horse, like all the higher animals, requires a constant supply of pure air to renovate his blood, and yet it must not be admitted in a strong draught, blowing directly upon him, or it will chill the surface, and give him cold. . . . By common consent it is allowed that no stable divided into stalls should give to each horse less than 800 or 1,000 cubic feet."

Youatt wrote: "It is not generally known, as it should be, that the return to a hot stable is quite as dangerous as the change from a heated atmosphere to a cold and biting air. . . . It is the *sudden* change of temperature, whether from heat to cold or from cold to heat, that does the mischief, and yearly destroys a multitude of horses."

One more quotation from John Osgood, who, in speaking of city stables, said: "Now, in the name of humanity and ordinary commercial thrift and sagacity, let this be stopped. There is no reason why stables should be horse hells! No reason why they should vie with 'The Black Hole' in their inevitable cruelty, and gloom, and destruction. These and city stables generally (with some exceptions) are a disgrace and a shame to a civilized community. So long as they continue as they now are, horses must die. There are no remedies for the sudden and violent diseases which will attend such poisonous air, and water, and food. The remedy lies in providing ample and well-ventilated stables — stables well lighted, with stalls of ample dimensions, with escape pipes for the ammoniacal effluvia which arises from so many animals and their excretions, with more room for evaporations; and then the chances would no longer be against every horse who passes through these doors, as they were against those ghastly ones who passed through Dante's gate, and as they went in, read above their heads:

'Who passes here goes into everlasting hell.'

"Improve the stables, then, and prevent disease. . . . Do not insult a respectable animal who has come from the country to do his share of the work of the world, and has brought with him the memory of the sweet hills and skies, at least, by immuring him in one of those cramped, rickety, rotten, stinking, slovenly, damp dungeons, where a dumb beast would lose his self-respect and his courage beneath an oppressive weight of miasmas, and hideous, gloomy, nasty confusion. Stop this, or pray that horses may die ere the evil days come."

The above, if it have weight, must convince you that badly-constructed stables are responsible for many, very many, of the diseases among horses. The paramount importance of abundant sunlight, perfect sewerage, and good ventilation is now, fortunately, recognized almost universally in building human habitations, but how often ignored in providing quarters for the horse, the number sick and unfit for duty most eloquently testifies.

I will now describe a stable just finished for the North Chicago City Railway. It fronts south 125 feet upon Belden Avenue, east 238 feet upon Jay Street, both of which streets are 66 feet wide. Along the west side there is an alley 16 feet wide, and 50 feet left vacant, extending to the car-house. On the north our property extends 12 feet beyond the stable. We therefore have light and ventilation upon four sides. The horses face north and south. In the rear of each row of horses there is an alley extending clear across the stable, 10 feet wide, with a sash door 7′ x 10′ at each end. Another alley 9 feet 6 inches wide extends the length of the stable at right angles to the former, with sash doors 7′ x 10′ at each end. The stalls are 9 feet deep, and each horse is allowed 56 inches of width. Double stalls are, in my opinion, the best, when horses will stand quietly together. So many of our horses will not do this, that I alternate two single stalls with one double stall, thus allowing the foreman to place the horses who will not stand quietly in single stalls. The floor of this stable consists of 4 inches of asphalt with 2″ x 4″ scantling bedded therein, 16-inch centres, to which the wearing floor of 2-inch pine is spiked. The stalls have an inclination of 2 inches, terminating in a gutter connected with the sewer. These gutters are covered with cast-iron plates 56 inches long by 6 inches wide, perforated to allow the urine to pass into the gutter. These covers are moveable, and at least once a week the foreman of the stable sees that they are taken up, and that the gutters are thoroughly cleaned. Some disinfectant should be freely used. Between each row of horses there is a "feed-alley" 4 feet wide. By this construction the horses are not brought head to head to breathe each the other's breath, contaminated, it may be, by disease which is thus spread from one to another. No food is wasted in placing it in the manger; and there is less danger of an employé being injured, or perchance crippled for life by some vicious or frightened horse. At each end of these feed-alleys windows are placed containing 32 lights, 9″ x 14″, a size of glass I have adopted as a standard and use whenever possible, to avoid carrying a stock of different sizes. In these feed-alleys, beneath the floor, there are placed fresh-air ducts, extending from outside to outside of the stable, through which air is admitted, passing out into the stable through perforations in the cover, thus avoiding injurious draughts. Its exterior openings are protected by cast-iron grates built in the brickwork, preventing the entrance of all vermin, and especially the pestiferous rat! In this stable there are nine ventilators, one located at the intersection of all alleys, for the exit of foul air. They are 6′ x 6′ at the lower end, and taper to 4′ x 4′ at the top, extending 8 feet above the roof. The four sides above the roof are movable (except the posts), inclining at an angle of 45°, thus deflecting the air upward and doing away with all downward currents, and permitting the opening to be reduced in cold or inclement weather, ropes extending to the ground floor for this purpose. We are indebted to the veteran in horse-railroad matters, John Stephenson, for this admirable idea. It resulted from many experiments made by him upon ventilation while a member of the New York School Board. The gas-burners located under these ventilators assist in ventilation by heating the air, which ascends and increases the outward-bound current of impure air.

The first story of this stable is 16 feet high, second story 7 feet at walls, and 9 at centre. Each horse has twelve hundred and sixteen cubic feet of space, an amount fully equal to modern theoretical requirements. The hay-loft can contain one year's supply, if needed. The feed department, with bins for storage, troughs 16 feet long, 4 feet high, and 3 to 4 feet wide for mixing feed, cut-hay room and horse-power to run the cutter is located upstairs. As we use shavings for bedding and can obtain them cheaply and abundantly in summer when the mills are busy, whereas they are scarce and high in winter, the bedding room is large. On the ground floor it is 16′ x 50′, and extends open to the roof, with an addition, 16′ x 70′ on the second floor. The cost of bedding for the horses purchased in this way is one-half cent per diem each.

The hospital, separated from the balance of the stable, is located at the north end, in the most quiet spot. Scales are provided upon which all supplies are weighed. An office for the foremen, room for grooms, another for conductors, and one for storage, are furnished, besides convenient closets, etc. I neglected to state that a number of catch-basins are provided to retain all shavings and solid matter that might otherwise get into and obstruct the sewer-pipes. These basins are 4 feet in diameter, and are cleaned out as often as may be necessary. They are trapped to prevent sewer-gas from entering the stable; all the roof water is used to flush these sewers. The building will be whitewashed in the fall, for health and comfort.

The above brief description will serve to give you an idea as to how far I have succeeded in putting in practice the requirements of theory. The stable has abundance of fresh air, contaminated air is removed, and there is good sewerage and plenty of light. The small percentage of horses in our hospitals most emphatically indorses the construction.

I think with Youatt that the stable should not be too warm in winter. Nature is a safe guide, and she provides the horse with a suitable covering. The stable temperature in my opinion should not vary more than 10 or 20 degrees from the external air. Keep the stable cool, and, if necessary, throw a blanket over a horse while hot, just in from work, during severe winter weather. Our car horses pass twenty of the twenty-four hours in the stable, and the importance of thorough sanitary arrangements is, of course, thereby increased, as the majority of horses used in other lines of business spend scarcely more than one-third as much time in the stable.

"A merciful man is merciful unto his beast," but the most refined selfishness, if intelligent, should cause each and every one with capital invested in horse-flesh to give it "suitable stable accommodations." Were my pen capable of expressing all I feel, most eloquent would be my appeal in behalf of the noble brute for whom I have ever entertained the deepest affection.

A UNIVERSAL MONUMENT.—A committee has been formed at Lucerne with a view to erecting what is called a "universal column." It is to measure 300 feet in height, and is to contain in its interior bronze bas-relief portraits of all the celebrated men and women of the present era. Another project of the committee is the building of a "museum of the nineteenth century," to be dedicated to art, science, inventions, commerce, industry, and to contain the busts and statues of all distinguished persons of these domains. The cost is estimated at 7,000,000 to 8,000,000 francs, and is to be met by subscription, lotteries, etc.—*Chicago Evening Journal.*

NOTES AND CLIPPINGS.

Pneumatic Postal-Service at Paris. — The organization of the pneumatic postal-service throughout Paris, which has lately been completed, has cost more than a million francs, and the length of the pipes is over thirty-four miles. This elaborate work was begun by M. de Couchy, who was director of French telegraphs under the empire seventeen years ago. The charge for transmitting a letter to any place within the fortification has been fixed at six sous. The service covers extreme points about seven miles apart. Under the most unfavorable circumstances a letter will be delivered to the remotest place, including its conveyance from the nearest station, within one hour. The saving of time and labor by the pneumatic postal service is expected to result in its adoption in other European capitals.—*Exchange.*

The Nouvel Opera, Paris.—Parisians being proverbially fickle, it is not surprising that they have grown tired of the Opera House, which is so important a landmark in the city, and are wishful that they could recover the old house in the Rue le Peletier. M. Garnier's grandiose building does not pay, and there has been difficulty in finding a manager to succeed the unhappy M. Vaucorbeil. Two gentlemen have now undertaken the office. It has been suggested that the building should be demolished, and the site appropriated to some other purpose. The area is 11,237 square metres, and at 11,000 francs per metre the ground would be worth 33,711,000 francs. To this should be added the value of the materials, the sculpture and mosaics. The group of dancers would probably secure a high price from its notoriety. A new opera-house could then be constructed by the State. It may be noted, however, as an indication of the modern spirit, that it is gravely recommended to erect the building without calling in the aid of an architect. One of the causes of the change in feeling towards the Opera House may be the fear of the consequences of having a large number of unemployed men. There is a pressing need of work in the building trades in Paris. It was lately said in the chamber that two years ago there were 100,000 masons in Paris, while at present there are only 70,000, of whom one-half are without employment.—*The Architect.*

An Experiment in Lumber-Drying.— An interesting experiment in drying timber, made by the Stephenson Car Company of New York, some years ago, is detailed in the *National Car Builder.* It became necessary to devise some method of seasoning that should be quick, and an apparatus which should be able to handle a considerable quantity of it in a short time. The plan which was suggested was the application of dry steam in direct contact with the wood. Furnaces were at once erected, and preparations made for the work. When the lumber first came from the furnace, it was as bright and handsome as could be desired. The steam was used at a pressure of 250 pounds per square inch. On opening the sticks, the timber was found to have been completely ruined. The whole interior had practically been converted into charcoal, so that it could be crumbled in the fingers, and was of brownish black color. Even so small a stick as an army wagon spoke would have its centre portion so destroyed as to leave cracks of one-third of an inch running through it, while the surface exposed to the direct contact of the steam was apparently bright and sound. This, of course, put an end to all attempts to dry the oak by the use of high-pressure steam, and they finally adopted a heat of about 150° Fahrenheit as a maximum. With this they were enabled in three or four days to remove 400 pounds of water from a ton of green oak. An idea has been generally prevalent that lumber dried by artificial heat loses something of its strength by the process. Just what this loss is, or how it affected the lumber, is not so generally known. The experiment detailed, however, shows that it is a carbonizing process, which can go on at low temperature, and this harmonizes completely with Count Rumford's experiments. He succeeded in completely charring thin shavings of beechwood, with a temperature, we believe, below 212°.—*Springfield Republican.*

Nankin's Porcelain Tower.—The city of Nankin, once the capital of China, has for centuries been famous to the "barbarians" of the outer world for its Porcelain Tower, a relic of the splendor of its ancient days, before Pekin usurped its dignity as the seat of the empire. The place is now to a great extent a city of ruins, and the city proper has shrunk to one-fourth of its former dimensions. The Porcelain Tower was built early in the fifteenth century, by the order of the Emperor Yung Loh, and as a work of filial piety. It was a monument to the memory of his mother, and he determined that its beauty should as far outshine that of any similar memorial as the transcendent virtues of the parent, in her son's eyes, surpassed those of the rest of her sex. No expense was spared in its erection, and its total cost is estimated at more than three-quarters of a million of our own money. The work was commenced at noon on a certain day in 1413, and occupied nearly twenty years in its completion. The total height of the Porcelain Tower was more than two hundred feet, or about equal to that of the monument of London, and it was faced from top to bottom with the finest porcelain, glazed and colored. It consisted of nine stories, surmounted by a spire, on the summit of which was a ball of brass, richly gilt. From this ball eight iron chains extended to as many projecting points of the roof, and from each chain was suspended a bell, which hung over the face of the tower. The same arrangement was carried out in every story. These bells added much to the graceful appearance of the tower, breaking its otherwise formal and monotonous outline. Round the outer face of each story were several apertures for lanterns, and when these were all illuminated, we are told, in the magnificent language of the Chinese historian, that "their light illuminated the entire heavens, shining into the hearts of men, and eternally removing human misery!" It is not difficult to imagine, however, that the appearance of the tower on such an occasion must have been beautiful in the extreme. On the top of the tower were placed two large brazen vessels and a bowl, which together contained various costly articles, in the nature of an offering and a charm to avert evil influences. Among these were several pearls of various colors, each supposed to possess miraculous properties, together with other precious stones and a quantity of gold and silver. In this collection, designed to represent the best treasures of the State, were also placed a box of tea, some pieces of silk, and copies of some ancient Chinese writings. The tower was demolished by the Taiping rebels in 1853.—*The World of Wonders.*

A Painter's Story.—The *Figaro* tells an amusing story of the tricks of the trade in pictures. A broker named D—— had signed a contract with a poor member of the brush, to take all the latter could produce; the consideration being two francs an hour! The line of the painter was military subjects. As soon as he had finished a painting, the broker took it away, changed the signature to that of "A. E. Gaubault," and sold it at a handsome profit. The consequence was that while the poor artist slaved during ten hours of the day at the rate of two francs an hour, and remained unknown to any but the rascally broker, the fame of "Gaubault" kept rising apace, and his pictures fetched higher prices every year. The painter happening to stroll into the Salon one day, recognized his handiwork, but not the signatures appended. Consulting his catalogue, he discovered "Gaubault's" address at the rooms of M. Bernheim, the well-known dealer in the Rue Maffite. Hastening there he introduced himself to the dealer as "Gaubault." "Ah," exclaimed M. Bernheim, "I congratulate you; you have achieved wonderful success. I have been wishing to make your acquaintance for the past six years." "Oh," replied the artist, "but my name is not 'Gaubault,' but Beauquesne," and he forthwith acquainted the dealer with his little contract with D——. Since then the latter has vanished, and Beauquesne signs the canvases which made his pseudonym famous, and which in turn brought him to the notice of those who had been admiring them at the Salon for the past three years. —*Galignani.*

Bessemer Steel Works in the United States. — There are twenty-one Bessemer steel works in the United States, and one in process of building. These twenty-one works contain forty-six converters, and three converters are building. The total annual capacity of the works completed is 2,490,000 net tons of ingots. The plant building is that of the Benwood Iron Works, at Benwood, W. Va. The States that have Bessemer works are: Massachusetts, one, with two four-ton converters; New York, one, with two seven-ton converters: Pennsylvania, nine, with twenty-two converters, and one building, ranging in size from two-ton to ten-ton; West Virginia, one, with two five-ton converters, and one building, which will have two four-ton converters; Ohio, three, with five converters, ranging in size from four-ton to ten-ton; Illinois, four, with nine converters, ranging from six-ton to ten-ton; Missouri, one, with two seven-ton converters; Colorado one, with two five-ton converters. The first Bessemer plant in the United States was erected in Troy, N. Y., and made its first blow February 15, 1865; the second was erected at Steelton, Pa., and made its first blow June, 1867; the third was erected in Cleveland, O., which made its first blow October 15, 1868. The largest Bessemer plant in the United States is that at Steelton, Pa., which contains two seven-ton and three eight-ton converters. The next largest are the Edgar Thompson, at Pittsburgh, and the North Chicago, at Chicago, which have three ten-ton converters. The domestic works are now more than able to supply all domestic demands for Bessemer steel, and one of them recently received a 10,000-ton order from Canada for rails.—*Scientific American.*

The Mezzotint Process.—The principle on which the process of mezzotint is founded, and the process itself, may be thus described: A plate of bright copper or steel is "rocked" backward and forward, and in all directions by a tool having a sharp serrated edge till its whole surface is indented and torn up. A sort of warp-and-woof pattern is thus produced upon it, while a pile like that of velvet is thrown up and evenly distributed over its whole surface. This pile, if charged with printers' ink, would print black; the pile removed by a "scraper," and the warp-and-woof pattern laid bare, the plate would print gray; the warp-and-woof pattern itself removed, white — because the plain surface of the plate would again be reached. If, however, instead of removing the whole of the pile only half of it be removed, a tint is obtained half-way between black and gray — a mezzotint. The art, therefore, of the mezzotint engraver consists in scraping away the metallic pile and in removing so much of the warp-and-woof pattern beneath it as he may find necessary to obtain the exact tints or tones he requires, and his skill lies in the precise value which he is able to give to each of these tones and tints. The instruments necessary to the purpose are three—a "rocker," or "cradle," with which to lay the ground; a sharp knife, or "scraper," with which to cut away the pile, and a burnisher with which to remove partially or entirely the warp-and-woof pattern below it. There is, however, no hard-and-fast rule as to the exact fashion of these instruments, or even as to the method of using them, the earliest mezzotinters having had recourse to a variety of methods for "laying their grounds." Thus Claude, who, like Rembrandt, seems to have heard of the process and tried it on one of his etched plates, rubbed its surface with pumice-stone, and then burnished away the tint produced by it; Eveodingen used a process which the nature of his work does not render very obvious: Rembrandt employed the etching needle itself in such a way as to throw up with its point as much of the pile, or "burr," as he required; Siegen had a method of his own, which produced an effect not unlike "stipple" (a mode of engraving previously in use); Rupert, whose work is singularly fine and painter-like, was contented to ground his plate as he went on, and in the degree necessary to each part of it, by the action of the burin or dry point with which he was actually working, his principle being not unlike that of Rembrandt. Turner obtained his color sometimes by the roulette, as in the etching of "Kirtstall Abbey," and sometimes, as in "The Calm," by a granulated substratum analogous to the warp-and-woof pattern, produced by what is called "soft ground etching." Others again used special tools to obtain the effect of different tissues — a rocker with a plain chisel-like edge, for instance, for silken materials, a tool with a serrated edge for grosser texture, and so on. Altogether, therefore, it will be seen that in the hands of a man of genius the *modus operandi* of mezzotint admits of considerable variety, while this very latitude of procedure renders it again peculiarly a painter's art. — *Seymour Haden in Harper's Magazine.*

GELATINE EDITION.

During the year 1885 a series of Gelatine Prints, (Heliotypes) photographed from the natural object, will be published in the AMERICAN ARCHITECT AND BUILDING NEWS.

These gelatine prints will be issued once a month to those subscribers only who will pay a dollar extra for the twelve prints.

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IT will greatly simplify our book-keeping and prevent future complaint, if those of our present subscribers who (having already paid to various dates of 1885) wish to receive the gelatine plates will make their remittances cover the *entire* year to January 1, 1886, by remitting at the rate of fifty cents for each remaining month, in addition to the dollar for the gelatine prints.

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BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

309,300. SASH-HOLDER. — James F. Hamilton, Connersville, Ind.

309,313. AUGER-HANDLE. — William A. Peck, Roe, Mass.

309,328. PROCESS OF SLAKING LIME. — William I. Adams, Baltimore, Md.

309,330. SELF-CLOSING HATCHWAY. — Philip V. Ball, Cowden, Ill.

309,339. PLANING AND MATCHING MACHINE. — Wm. M. Dwight, Detroit, Mich.

309,351. WELL FOR SLOP-BUCKETS. — Frank Menke and Joseph Kroll, St. Louis, Mo.

309,363. APPARATUS FOR PAINTING WIRE-SCREENS. Chas. J. Shipley, Detroit, Mich.

309,367. BRICK-MACHINE. — Joel Tiffany, Hinsdale, Ill.

309,388. SAW-HANDLE. — William H. Hankin, Jr., Brooklyn, N. Y.

309,389. WRENCH. — William P. Heffron, Chicago, Ill.

309,393. HINGE. — John H. Lawrence, Sterling, Ill.

309,395. TRAP. — Ezra S. McClellan, Paterson, N. J.

309,400. JOINER'S PLANE. — George D. Mosher, Birmingham, Conn.

309,413. WEATHER-STRIP. — Jacob J. Smith and Frank H. Schwartz, Lima, O.

309,435. LADDER-BRACKET. — John R. Bodell, New Salem, O.

309,436. BOILER FOR HEATING PURPOSES. — Henry Burt, Danforth, N. Y.

309,438. TOOL-HANDLE. — Cyrus Carleton, Providence, R. I.

309,449. ELEVATOR. — Walter L. Folstead, Richmond, Va.

309,459. METALLIC ROOFING. — Millard F. Hamsley, Nashville, Tenn.

309,472. ROOFING-MACHINE. — Henry A. Leber, Cape Girardeau, Mo.

309,490. FIRE AND WATER PROOF ROOFING-PAINT. — Charles H. Phillips and Wallace M. Taylor, Alpena, Mich.

309,495. HOT-AIR FURNACE. — David McCreary Russell, Washington, D. C.

309,527. FIRE-ESCAPE. — G. Van Ness Covert, Farmer Village, N. Y.

309,538. SCREW-ELEVATOR. — Lorenzo S. Graves, Rochester, N. Y.

309,545. FIRE-ESCAPE. — Otto Hirt, Carlsbad, Austria-Hungary.

309,549. BRICK-MACHINE. — Joseph J. Kulage, St. Louis, Mo.

309,550. SAW. — Joseph Ledward, Westerly, R. I.

309,551. TIN-SEAMING MACHINE. — William A. List, Wheeling W. Va.

309,568. ROOFING-TILE AND APPARATUS FOR THE MANUFACTURE THEREOF. — Carl Schlickeysen, Berlin, Germany.

309,580. WEATHER-STRIP. — George W. Snyder, Western College, Io.

309,586. ARTIFICIAL STONE OR BUILDING-BLOCK AND PROCESS OF MAKING THE SAME. — Otto J. E. Vogelbach and John Christian Wieland, Philadelphia, Pa.

309,589. BRICK-MACHINE. — Geo. J. Weber, Boonville, Mo.

309,599. TRANSOM-LIFTER. — Augustus R. Brand, Philadelphia, Pa.

309,601. COMBINED DOOR-KNOB AND BUTTON. — Mary Broughton, Brooklyn, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report but one permit has been granted, which is not of sufficient importance to note.

Brooklyn.

BUILDING PERMITS. — *Hull St.*, n s, 150' w Hopkinson Ave., 3 two-st'y frame dwells., tin roofs; cost, each, $2,200; owner and architect, Baldwin Pettit, 289 Chauncey St.; builders, Ernst Sutterline and J. Collins.

Macon St., s s, 66' w Hopkinson Ave., 3 two-st'y brick dwell., gravel roofs; cost, each, $3,000; owner and builder, James G. Porter, 405 Pearl St., New York; architect, Thomas S. Godwin.

Meserole Ave., n s, 15' e Lorimer St., one-st'y frame skating-rink; gravel roof; cost, $3,000; owner, Elliott & Co., Flatbush, L. I.; architect and builder, Stephen M. Randall.

Evergreen Ave., e s, 55' n Bleecker St., two-st'y frame (brick-filled) dwell., tin roof; cost, $3,000; owner and builder, Ernst Loerch, 61 Himrod St.; architect, Th. Engelhardt.

Greene Ave., n s, 400' e Nostrand Ave., 3 three-st'y brown-stone dwells., tin roofs; cost, each, abt. $8,000; owner, Lewis B. Reed, Mansion House, Brooklyn; architect and builder, Geo. H. Stone.

Lexington Ave., n s, 100' e Bedford Ave., 15 two-st'y brick dwells., tin roofs; cost, each, $4,000; owner, T. H. Robbins, Keyport, N. J.; architect, Amzi Hill; builder, E. K. Robbins.

Lee Ave., n w cor. Middleton St., one-st'y frame skating-rink, cement roof; cost, $3,000; owners, Hegnell & Wood, 57 Lynch St.; architect, E. F. Gaylor; builder, not selected.

St. Mark's Pl., late Wyckoff St., n s, 69' e Fourth Ave., three-st'y brick dwell., tin roof, wooden cornice; cost, $5,000; owner, H. S. Stewart, on premises; architect, R. Dixon; builder, J. H. Woolley.

Locust St., n s, 125' e Broadway, three-st'y frame tenement, tin roof; cost, $4,500; owner, Henry Hoffman, 135 Leonard St.; architect, F. Holmberg.

De Kalb Ave., *No.* 1356, s s, 250' w Hamburg Ave., five-st'y frame tenement, tin roof; cost, $4,300; owner and builder, Fred. Stemler, Suydam St., near Myrtle Ave.; architect, F. Holmberg.

North Fourth St., *No.* 81, n e, 175' w Third St., three-st'y brick tenement, tin roof, iron cornice; cost, $5,500; owner and builder, Wm. S. Collins, 81 North Fourth St.; architect, A. Herbert.

Bremen St., *Nos.* 29 *and* 31, w s, 150' n Adams St., two-st'y brick ice-house, tin roof; cost, $7,000; owners, Danenberger & Co.; architect, Charles Stoll.

Suydam St., s s, 380' e Broadway, two-st'y (brick-filled) dwell., tin roof; cost, $4,000; owner and builder, Tereesa Lanzer, 11 Suydam St.; architect, John Herr.

Cedar St., s s, 86' 4" n Myrtle Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $3,500; owner and builder, Fr. Herr, 778 Broadway; architect, John Herr.

Nassau Ave., s s, 30' e Lorimer St., 5 three-st'y frame (brick-filled) tenements, gravel roofs; cost, each, $2,500; owners, architects and carpenters, Randall & Miller, 68 Nassau Ave.; mason, —— Van Riper.

Van Cott Ave., n w cor. Oakland St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $5,600; owners, Roeden & Kollmann, n e cor. Van Cott Ave. and Oakland St.; architect, Fred. Weber; builders, Martin Vogel and Thos. Keppie.

Vernon Ave., *Nos.* 285-291, n s, 125' e Sumner Ave., 2 five and four st'y brick and stone brewery and ice-house, tin roof, brick cornice; cost, $60,000; owner, Ferdinand Munch, 283 Vernon Ave.; architect, Charles Stoll; builders, John Auer and John Rueger.

Harman St., n s, 80' w Central Ave., 10 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $2,700; owners, etc., Cozine & Gascoine, 307 Evergreen Ave.

ALTERATIONS. — *Willoughby St.*, n w cor. Bridge St., one-st'y brick extension, gravel roof; cost, $3,000; owner, P. A. Panier, on premises; architect, C. F. Eisenach; builder, W. Zang.

Pacific St., s w cor. Henry St., add two-st'y, also three-st'y brick extension, tin roof; iron cornice; cost, $13,000; owner, Long Island College Hospital; architect, W. B. Tubby; builders, James Ashfield & Son and Martin & Lee.

Chicago.

BUILDING PERMITS. — Indiana Club, additional story, 3349 Indiana Ave.; cost, $3,500.

Allen Pinkerton Estate, 3 two-st'y dwells., 533 to 537 West Monroe St.; cost, $15,000; architects, Treat & Foltz; builder, E. Sturtevant.

F. Bigdon, two-st'y flats, 97 Laflin St.; cost, $4,000.

Mrs. M. Willeys, two-st'y dwell., 2313 Washington St.; cost, $4,000.

M. Flemming, three-st'y store and flats, 308 Blue Island Ave.; cost, $7,000; architect, F. Keltinech, builder, N. Provost.

C. Watrons, four-st'y flats, 312 and 314 North State St.; cost, $15,000; architects, Frommann & Jebson; builder, A. Carlson.

F. W. Campbell, 3 three-st'y dwells., 487 and 489 Jackson St.; cost, $15,000; architects, Edbrooke & Burnham; builders, Campbell Bros. & Co.

J. W. Brooks, two-st'y dwell., 966 Jackson St.; cost, $5,000; architects, Edbrooke & Burnham; builders, Campbell Bros. & Co.

J. W. Brooks, 2 three-st'y stores and flats, 879 and 881 Polk St.; cost, $16,000; architects, Edbrooke & Burnham.

H. Copeland, 7 two-st'y dwells., Flourney St., cor. Hoyne Ave.; cost, $16,000; architect, H. Copeland; builder, Wilkie.

New York.

HOUSES. — Mr. Edward Kilpatrick proposes to build 4 four-st'y brown-stone houses, on the n w corner of Madison Ave. and Eightieth St.

Mr. Wm. H. Hays will build a number of houses on Ninety-second and Ninety-third Sts., bet. Ninth and Tenth Aves., all from designs of Messrs. D. & J. Jardine.

FLATS. — For Messrs. Wm. and Philip Ebling, 5 five-st'y brown-stone flats and stores, are to be built on the n e cor. of First Ave. and Seventy-second St., at a cost of $70,000; from designs of Mr. Anthony Pfund.

For Mr. Peter Uhlein, 2 five-st'y brick and brown-stone tenements and stores are to be built on the e s of First Ave., bet. Eighty-eighth and Eighty-ninth Sts., at a cost of $28,000; from plans of Mr. John Brandt.

FACTORY. — On the s s of Thirty-first St., 175' w of First Ave., a 50' front piano factory is to be built by Messrs. Stultz & Bauer.

BUILDING PERMITS. — *Pitt St.*, *No.* 12, five-st'y brown-stone tenement, tin roof; cost, $18,000; owner, Chas. Boswald, 73 Ludlow St.; architect, W. Graul.

Seventy-fifth St., s s, 100' w Boulevard, 5 three-st'y brick and stone dwells., tin roofs; cost, each, $16,000; owner, Daniel D. Brandt, 38 Bank St.; architect and builder, Wm. J. Merritt.

Third Ave., *No.* 2009, three-st'y brown-stone front store and club-room, tin or gravel roof; cost, $7,000; owner, Henry Budelman, Jr., 117 East One Hundred and Eleventh St.; architect, A. E. Fountain.

East Twenty-fourth St., *Nos.* 337 *and* 339 2 five-st'y brick tenements, tin roofs; cost, each, $18,000; owner and builder, John Fish, 97½ Ninth St.; architect, Richard Berger.

East Eighty-second St., *No.* 310, s s, 150' e Second Ave., one-st'y brick factory and stable, tin roof; cost, $2,500; owner, Wm. E. Seitz, 431 West Twenty-eighth St.; architect, A. E. Hudson; builder, John J. Kierst.

Willis Ave., n e cor. One Hundred and Forty-eighth St., three-st'y brick refrigerator, office and tenement, tin roof; cost, $12,000; owner, Edwin C. Swift, Lowell, Mass.; architect, F. Miller; builder, B. F. Bailey.

Second Ave., s w cor. One Hundred and Fifteenth St., five-st'y brick store and tenement, tin roof; cost, $20,000; owner and builder, John Walker, 233 East One Hundred and Thirteenth St.; architect, J. H. Valentine.

Second Ave., w s, 22' s One Hundred and Fifteenth St., 2 five-st'y brick stores and tenements, tin roofs; cost, each, $20,000; owner, architect and builder, same as last.

Pitt St., *No.* 14, five-st'y brown-stone tenement, tin roof; cost, $18,000; owner, Hermann Von Natzmer, 57 East Seventh St.; architect, Wm. Graul.

Southern Boulevard, n e cor. Hull Ave., two-st'y frame dwell., shingle roof; cost, $6,000; owner, D. R. Kendall, President and Treasurer, 111 Broadway; architect, [illegible] Marsh; builders, J. V. Hedden & Son.

One Hundred and Forty-third St., *Nos.* 691-697, n s, 300' e Willis Ave., 4 two-st'y and basement brick dwells., tin roofs; cost, each, $4,000; owner, Charles Van Riper, 653 East One Hundred and Forty-third St.; architect, H. S. Baker.

Sixty-sixth St., s s, 75' w Ave. A, 7 five-st'y brick tenements, tin roofs; cost, each, $15,000; owner, Frank R. Crumbie, Nyack, N. Y.; architect, J. H. Valentine.

One Hundred and Seventy-fifth St., s s, 100' e Washington Ave., 3 two-st'y frame dwells., tin roofs; cost, each, $2,500; owner, Angus MacIntosh, High Bridge; architect, Joseph Kirby.

South St., part of piers 32 and 33, East River, and the bulkhead bet. said piers, one-st'y and part two-st'y frame (covered with iron) freight-shed, gravel roof; cost, $22,000; lessee, The Long Island R. R. Co., J. R. Maxwell, vice president, 115 Broadway, architect, Anthony Jones.

One Hundred and Twenty-second St., n s, 250' w Seventh Ave., 2 three-st'y brick and stone dwells., tin roofs; cost, each, $8,000; owner, Phebe Smith, 1475 Broadway; architect, Geo. B. Pelham.

Elm St., *No.* 55, five-st'y brick factory, tin roof; cost, $14,000; owners, Radway & Co., 32 Warren St.; architect, Wm. Pistor.

Philadelphia.

BUILDING PERMITS. — *Columbus Ave.*, n s, bet. Fifth and Sixth Sts., one-st'y store, 12' x 44'; H. M. Martin, owner.

Wallace St., *No.* 1811, five-st'y building, 17' x 78'; Jas. P. Doyle, contractor.

Pechin St., above Shurs Lane, 2 two-st'y dwells., 16' x 42'; Wm. Raynor, owner.

Frankford Ave., *No.* 2924, two-st'y store, 18' x 30'; George Kessler, contractor.

Queen St., e of Laurence St., three-st'y dwell., 20' x 45'; Jno. Durkin, owner.

Brown St., bet. Delaware Ave. and Front St., two-st'y stable, 27' x 68'; R. C. Ballinger, owner.

School St., e of Ridge Ave., 2 stables, 32' x 58'; Geo. Wood, contractor.

Ludwig St., bet. Haverford and Lancaster Aves., two-st'y dwell., 14' x 28'; J. Hayes, owner.

Ridge Ave., bet. Twenty-seventh St. and Berks Hall, triangular shape, 40' x 57' x 64'; Jno. F. Betz, owner; Wm. Gelte, architect.

Fourth St., between Brown and Poplar Sts., ice-house, 20' x 82'; Jas. P. Doyle, contractor.

Columbia Ave., between Carlisle and Fifteenth Sts., one-st'y marble-shop, 24' x 25'; Chas. Dading, owner.

Nice St., below Baker St., two-st'y dwell., 16' x 30'; McLaughlin & McNamara, contractors.

No change in the quotations this week.

St. Louis.

BUILDING PERMITS. — Fifty-two permits have been issued since our last report, nineteen of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

John Schumacher, two-st'y brick dwell.; cost, $3,-[illegible]; J. Schumacher, contractor.

C. B. Clark, three-st'y warehouse; cost, $9,000; sub-let.

C. G. Stifel Brewing Co., three-st'y machine-house; cost, $20,000; L. Jungenfeld (dead), architect; sub-let.

Frank Raffle, two-st'y brick store and tenement; cost, $5,000; sub-let.

D. M. Osborne & Co., four-st'y brick warehouse; cost, $25,000; sub-let.

F. W. Wesseler, two-st'y dwell.; cost, $5,000; A. Whri, contractor.

Henry Wanschaffe, two-st'y dwell.; cost, $3,300; Hy. Wanschaffe, contractor.

J. Billmeyer, two-st'y stores and dwells.; cost, $4,000; Henry Hagen, contractor.

Hugh Brennar & Son, two-st'y dwell.; cost, $4,000; D. J. Dempsey, contractor.

COMPETITION.

CHAMBER OF COMMERCE BUILDING.

[At Cincinnati, O.]

The Cincinnati Chamber of Commerce contemplates the erection of a new building, and invites designs from architects.

Circulars can be obtained on application to the Clerk of the Board.

471 GEORGE S. BRADBURY, Clerk.

COURT-HOUSE.

[At Toronto, Can.]

TORONTO, December 23, 1884.

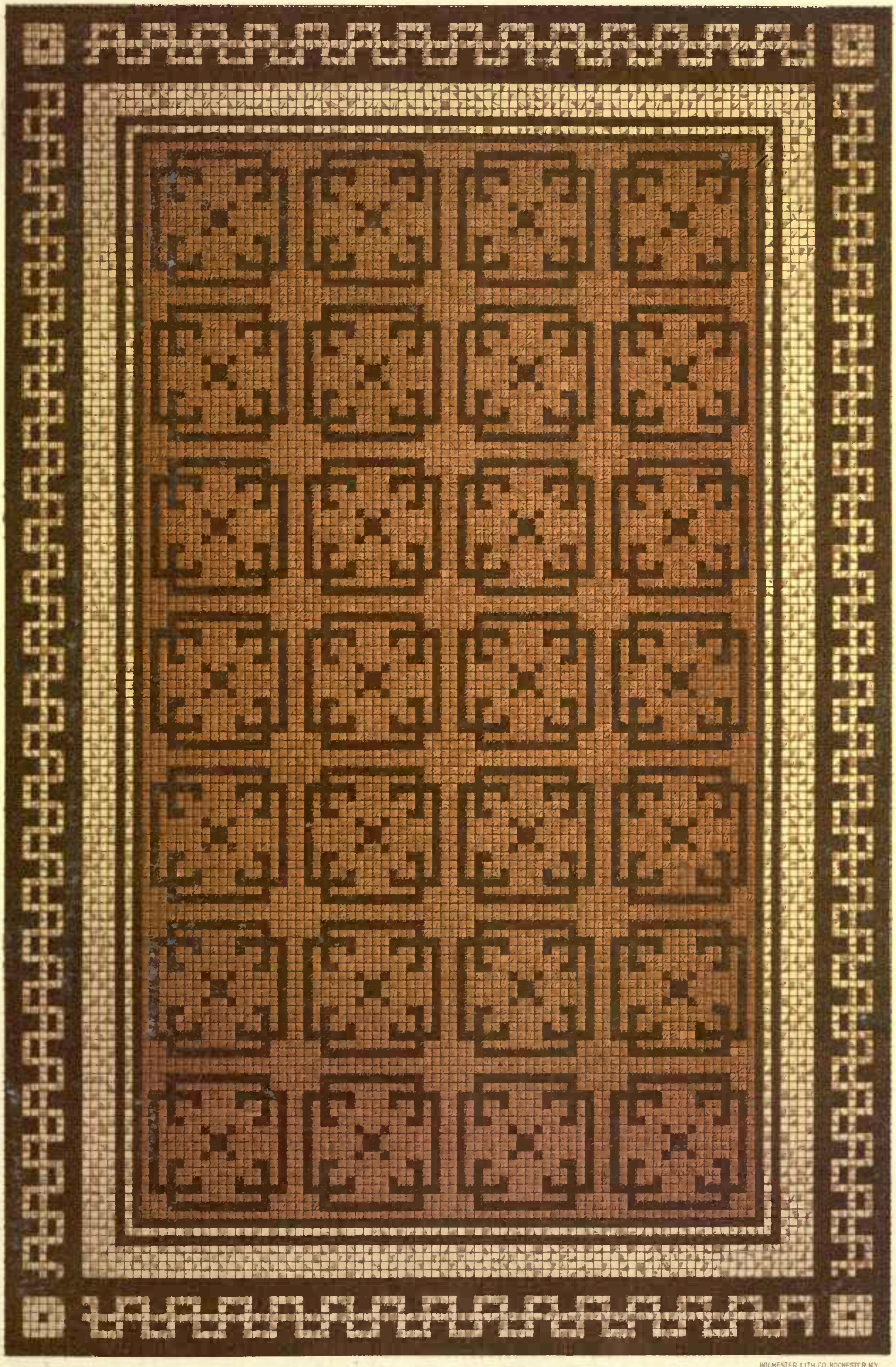
Designs, in competition for a court-house, to be erected on Queen St., at the head of Bay St., in the City of Toronto, will be received by the Court-House Committee of the City Council **up to noon of Wednesday, the 23d day of March, 1885.**

Premiums will be awarded as follows: "First prize the carrying out of the works as set forth in the instructions; second, $500; third, $400; fourth, $200."

All further information can be had on application at the City Clerk's Office, City-Hall Buildings, Toronto.

DAVID WALKER,
Chairman Court-House Committee.

DESIGN No. 213.



ROCHESTER LITH. CO. ROCHESTER N.Y.

WOOD-MOSAIC FLOOR.

DESIGNED AND LAID BY W. C. RUNYON & CO.,
ROCHESTER, N. Y.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS.

THERE are a few things which may be spoken of to advantage at this time, in explanation of the routine of the business management of this journal. First, as to the delivery: every copy, except those for Boston and New York, goes through the mail, and, except in the case of large cities where there are many subscribers, each subscriber's copy is rolled. All copies intended for subscribers in large towns are made up in one or more large packages, and reach the office of delivery *perfectly flat and uninjured;* whatever treatment they receive after this depends on the humor of postal-clerks and letter-carriers. We are in no way responsible for any *folding* or *creasing* of a copy, and yet we receive constant complaints. As cures for this evil we suggest a modest *douceur* for the letter-carrier, whose pouch is large enough to receive the journal unfolded, if it is made worth his while to think so, an enlargement of the letter-slit in the office-door, or the establishment of a suitable letter-box at the lower entrance. As to delivery by hand, it is to be borne in mind that carriers are human and architects' offices are far above ground, so that a certain amount of shirking by a weary boy or man is inevitable. Next, as to remittances: A certain number of subscribers pay their subscriptions promptly at the end of the year, before they receive their annual bills, and yet complain that they immediately thereafter receive a bill, not stopping to reason out that the remittance and the bill crossed each other in the mails. Changes in the dates upon the address labels are made once a month only, and if this is remembered we shall be spared another series of fault-finding. To prevent another line of complaints, which we anticipate, we will state that the gelatine plates will probably be issued with the last number for each month, though it is possible they may appear with some irregularity.

WE must say a word, too, about our somewhat formidable-looking bill-head, which is the cause of our receiving an occasional insulting letter from a peppery subscriber, who cannot perceive the difference between saying the same thing in print, to all alike, and saying it in writing, to himself alone. There are two ways of conducting a subscription business: one, to cancel the subscription at its expiration; the other, to let it run until the subscriber definitely orders it to be cancelled. The first is the fairest and most equitable for both parties, but it is only possible to daily papers or to magazines with large subscription lists, where a majority of the subscriptions do not terminate at the same date. The second is the course which has to be followed by technical journals whose circulation is restricted. The courts recognize that the onus in such cases rests with the subscriber, and the Government recognizes it by providing post-masters with printed forms for notifying publishers that a subscriber wishes to discontinue his journal. Take a concrete case, our own, for instance: what would happen if we should cancel all subscriptions at the date of their expiration? The circulation would drop at once from thousands to hundreds, at the beginning of a year, since all but a few subscribe for the even year. Then would come a deluge of complaints from subscribers who felt themselves, and whom we felt, to be permanent subscribers, and a demand for the omitted numbers, which we might not have provided for. The matter is complicated, too, by the liberal policy we have adopted of carrying a stock of back issues. A person who intends to be a regular subscriber to a daily paper, but who chances to be cut off, never thinks of asking for the copies he has missed, and could not get them if he did. With us it is different, for we know the journal is kept and bound at the end of the year, and we have to provide for replacing missing numbers, and should we provide too large a stock for this purpose, our loss would be great, as the expense of manufacturing such a paper as the *American Architect* is not small. In short, the system we follow is rather in the interest of our subscribers than in our own, and we must be allowed to continue to use our inflammatory bill-head, for, thanks to it, our losses through delinquent subscribers have been much lessened since its adoption. In conclusion we must ask our subscribers to be reasonable in their complaints at all times and particularly just now, when the division now making between "gelatine" and "regular" subscribers vastly complicates our work and increases the possibilities of making blunders.

AN advertisement in the English papers reminds us of an experiment of our own, which may be of interest to our readers. The advertisement in question gives the address of a manufacturer of india-rubber socket-rings for the joints of hot-water pipes. These rings are much used in and about London for jointing the hot-water pipes employed for heating greenhouses; and having seen the method highly commended in the English horticultural books, we tried, not long ago, to get some rings for a small greenhouse in which we happened to be interested. No rubber manufacturers that we could find, however, had ever made or heard of such things, and Mr. Hitchings, of New York, an excellent authority on such matters, although he knew that the rings were used in England, had never seen them applied, and thought they could not be obtained in this country. These difficulties only made us more anxious to try the experiment, and we had some rings made, according to our own rather vague idea of what they ought to be, which, however, succeeded very well, and have so far proved tighter than either the red-lead and oakum joints, of which four were used in connecting an expansion-tank, or the rust joints employed in another greenhouse constructed under our care at about the same time. In fact, only one of the rubber ring-joints has leaked at all, and this is already closed, as the English books explain it, by the gradual adaptation of the rubber to the inequalities of the two surfaces with which it is brought in contact.

THE method of forming the new joint is very simple. The ring which we used is of round rubber, three inches in diameter, the diameter of the section of the rubber being three-eighths of an inch. The pipes on which they were used are four inches in external diameter, and the hubs are four-and-one-half inches. The ring is placed over the spigot end of the pipe, as near the end as possible, and the pipe then pushed into the hub. The ring rolls back, as the pipe is pushed home, but of course moves through a much shorter distance, and, by the time the spigot end of the pipe reaches the bottom of the hub, the ring has been rolled about half-way down, and remains there, compressed between the hub and the pipe into an elliptical section, the minor diameter of the ellipse being, about one-quarter of an inch. This compression causes the soft rubber to fill the irregularities of the castings, making a good joint with a comparatively rough pipe. As it takes but a moment to apply the ring, and push the pipe into its place, the joints are very rapidly made, and they can be taken apart and re-made with equal ease if it should be necessary, while the elasticity of the connections permits adjustments of the pipes, after they are put together, which would be impossible if rust joints were used, without breaking the pipes, and could not be made without causing red-lead and oakum joints to leak badly. In our own case this quality of the ring joints enabled us to take out a pipe, and substitute a longer one, with a vapor pan on it, without disturbing the other connections, except to push the adjoining fittings far enough aside to allow the old pipe to be taken out and the new one slipped into its place. How durable the joints will be we cannot tell, although they are said to remain sound in England for "many years," and are much less liable than caulked or rust joints to leakage from the alternate expansion and contraction of the pipes.

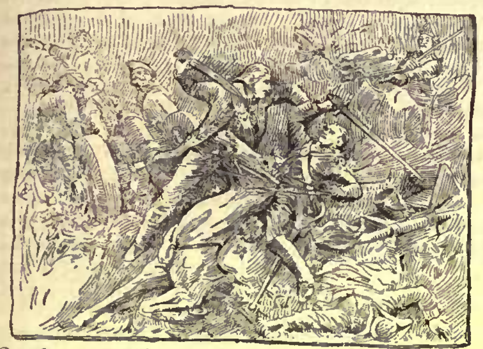
A CURIOUS experiment was shown a year or two ago, in which a long glass tube was filled with earth, and sewage poured in at the upper end. If the tube was long enough, perhaps six or eight feet, the liquid issued from the bottom clear and pure, its dissolved and suspended organic matters having been oxidized by the soil. If, however, before pouring in the sewage, a little dilute chloroform were allowed to filter through the earth, sewage subsequently applied passed through the tube without change, the oxidizing action of the soil being completely suspended. After some hours, or days, the soil regained its oxidizing quality. This experiment was believed to show that the oxidation of organic matters in sewage was something more than a chemical reaction, and that it depended, at least to a certain extent, on the presence of small living organisms, whose activity could be temporarily suspended by an anæsthetic, and with it the oxidation of the sewage. This theory has now been confirmed by additional observations, and the little creature which converts into fixed and harmless salts the putrefying impurities of such sewage as it can reach is believed to be a micrococcus somewhat resembling the yeast plant. Many and varied tests have been made to determine the conditions under which the disinfecting microbe lives and acts, and a good deal has been learned about its habits. It is found that it flourishes best, and is most efficient, at a temperature of about ninety-eight degrees Fahrenheit, nearly the temperature of the blood. At higher or lower temperatures its action becomes more feeble, and ceases altogether near the freezing point, or above one hundred and thirty degrees. Experiments to show its distribution in a clay soil, show that it is most abundant in the upper six inches, but is found to a depth of a foot and a half. Below that depth it cannot live, and soil taken more than eighteen inches below the surface has hitherto always failed to induce any change in nitrogenous solutions to which it was applied. These experiments cast a great deal of light upon many questions of sewage disposal by subsoil or surface irrigation, and further tests, made with some reference to this, would be easily made, and extremely valuable. It is found, for instance, that nitrogenous solutions, in order to be acted upon by the oxidizing ferment, must be alkaline, acid liquids remaining unaffected. This observation shows at once that where sewage is to be purified by irrigation, chemical wastes must be kept out of the drains. Normal house sewage is generally slightly alkaline, and in good condition for conversion, but the admission of the acid or poisonous wastes from a dye-house, metal-working shop, or manufactory of any other kind might render the sewage of a whole town incapable of purification.

LA Semaine des Constructeurs gives some details of asphalt paving, which have a good deal of interest. The account begins by mentioning that asphalt makes a better pavement in London than in Paris. The same material that is used in Paris, put down in London by French workmen, gives a smooth and durable surface, which remains good long after the same work in Paris would have been worn into holes and ruts. The reason of this is probably to be sought in the difference of climate. Nothing is so unfavorable to asphalt as alternations of heat and cold, and the mild, even English climate is well suited to it. Another cause of the inferiority of the Paris paving is said by *La Semaine* to be the continual digging up of the streets for laying drains, water and gas pipes. Although the trenches are immediately refilled, the earth in them is soft and compressible for a long time afterward, and an unyielding foundation is the first essential of every good pavement. The repairs of asphalt in London are also much more carefully made than in Paris. Every depression is attended to before it forms a hole: the imperfect asphalt is taken out, and with it the concrete foundation; the place is then cut out, with vertical sides, and in a square or rectangular outline, well into the sound surrounding pavement. If the subsoil is disturbed the place is filled to the proper grade, and allowed to settle for several days, and then thoroughly rammed. New concrete is then laid, and covered with boards until it has set properly; and, finally, the asphalt coating is restored. Of the cheaper varieties of artificial asphalt paving the Grahamite, used extensively in Washington, is most favorably mentioned. This, as our readers know, is composed of sand, powdered limestone, and Trinidad asphalt, mixed with about twenty per cent of petroleum. The artificial pitch is added to the sand and limestone in the proportion of about one of pitch to one of limestone and five of sand, and the mixture is spread in two separate layers over a bed of concrete. A similar pavement has been tried in Paris, and is found to answer very well in streets where the traffic is light. In much-frequented thoroughfares it does not last long.

THE American railway companies which depend for their income in part on the transportation of emigrants might do well to observe the arrangements which have been made by the General Transatlantic Company of France to secure business of that kind by the certain method of making their passengers comfortable. As about twenty thousand persons a week cross the Atlantic, paying a good price for their passage, there is a constant competition among the foreign steamship companies for their patronage. The ancient days of emigration, when this country received as a citizen any one who chose to come, without inquiry as to his character, are now over, and every person who lands at Castle Garden is obliged either to show that he is capable of supporting himself here for at least a limited time, or to take passage home again by the next return ship; so that the class of emigrants now carried is composed of people who have saved up some property, and having been accustomed to living in a certain degree of comfort, are not disposed to put up with the dirt and disorder which were once considered good enough for steerage passengers. The General Transatlantic Company has the reputation of providing carefully and liberally for its poorer patrons, but most of the emigration is from Germany and Switzerland, and the neighboring region, and the expense of travelling by rail across France to the port of embarkation at Havre adds so much to the cost of the journey that passengers who are obliged to economize prefer the longer, but cheaper route to New York by way of Hamburg, Bremen, or Antwerp. In order to offset to a certain extent this disadvantage, the Transatlantic Company has now put on regular emigrant trains, running through every day from Basle, which is a great railway centre for the whole of Central and Southern Germany, Switzerland, and Italy, to the steamship wharf at Havre. The trains leave Basle at hours regulated by the tide at Havre, so that on reaching the ship, after a ride of twenty-one hours, they can embark and set sail without delay. In order to attract custom, the emigrant train is furnished with cars differing completely from the ordinary third-class "coach" in Europe, but reproducing minutely the ordinary American passenger car. As with us, a clear passage is left through the whole length of the train, and the cars, which are very long, and hold eighty passengers each, are warmed by hot-water circulating pipes, and a boiler in one corner, just like those on our best-managed roads. Other luxuries, familiar to us, but almost unknown abroad, are added, in the shape of a drinking-water reservoir, and a water-closet in each car, with a wash-basin; and there are some special features, such as cradles, to the number of a dozen or more in each car, which must add greatly to the comfort of the families who travel in the trains. Very capacious places are provided for the hand-baggage, of which poor emigrants always carry immense quantities, and the Swiss, or Tyrolese, or German, or Piedmontese peasants can take their last look at the Rhine or the Alps from the windows of the car in which they remain, warm and comfortable, until they arrive alongside the ship which is to carry them to the New World. To the untravelled and simple villagers of the interior provinces, this is a great satisfaction, and it is no less for their benefit that the officers of the Transatlantic Company are enabled, by the same arrangement, to keep an oversight over the whole company, and guard them from the tricks of the swindlers and parasites, who, as *Le Génie Civil* says, profit by the ignorance of the poor emigrants to defraud them. The care of the company is not confined to mere oversight. To each train is attached a dining car, or rather, a refreshment counter, where meat, bread, and other viands are dispensed at cost price; while coffee is distributed gratuitously through the whole train twice a day, and milk for children can be had at any time for the asking.

A CORRESPONDENT asks us for references to adjudicated cases bearing upon the right of an architect to be paid for drawings and specifications for buildings not carried out. We are very sorry not to have been able to look up references in the law reports, but his counsel has undoubtedly done so. When the index to cases affecting architects and builders, which we have had for some time under way, is completed, we shall be able to answer all such questions promptly.

THE PERSONAL EQUATION IN RENAISSANCE ARCHITECTURE.[1]



Panel in the Monmouth Battle Monument: N. J. Subject, "Ramsey defending his Guns" — designed by J. E. Kelly: N. Y.

IT is a truism to say that the qualities of Gothic and of Renaissance civilization are graphically expressed in their respective arts, and that the characteristic differences between these two arts constitute the most suggestive evidence of the conditions of the societies out of which they grew. Referring to architecture in especial, I ask you to consider with me some of these differences, with a view to ascertaining the true functions of the men who were more immediately concerned in producing them. Writers of general history collect and analyze traditions, documents, and archives with infinite patience and industry, but the evidences of architecture are inaccessible to them, because those who have written upon this subject have confined their studies rather to its external and technical manifestations, as to a development of natural forces, than to the human interests, from which they proceeded; the human wants, to which they were adjusted; the human skill, which gave to them character and direction. Behind every apparent form in architecture is a human motive, and a great monument, therefore, which is a concert of innumerable forms, must, as I conceive, constitute an invaluable record of the civilization which produced it. It is not merely an incident in the history of architecture, but an incident in the history of mankind. I am persuaded that the time is not far distant when it will be possible to predicate from the internal evidence contained in such a work, the true genius of the times, the bases of contemporaneous history. Thus the Cathedral of Paris, to take a familiar example, if it could be properly analyzed, would be found to contain not only all that it is essential to know of the spirit of the Middle Ages in general, of the fall of the monastic orders, of the decay of feudalism, of the birth of civil liberty, but in specific detail all the religious, social, and political life of the time; and this not so much because it is a great municipal and ecclesiastical monument, but because it is a work of art.

Mediæval architecture was a gradual and steady evolution of structural forms, with but little influence from external traditions, and under exceptional conditions of enthusiastic devotion and religious zeal. It was saved from barbarism and savagery, first, by the learning of the cloisters, and afterwards by the coherence of the lay architects or masonic guilds, which preserved, developed, and transmitted a compact and consistent body of building traditions. The process of evolution progressed with amazing rapidity; it pushed Gothic art to its highest expression in the thirteenth century, and in the fifteenth, this art had said all that it had to say; it had become an architecture of *tours de force* of conceits and grotesques; as its strength failed, it became attenuated and affected, and at the end, the skill of the craftsman triumphed over the inspiration of the artist. It was, I say, an architecture of structural evolution; and so long as the evolution continued in a healthy condition, it was as free from abnormal examples as the evolution of any animal or vegetable type in natural history. The successive buildings of the style were links in a continuous chain, each one essential to the development of the type. By this series of tentative processes the art of constructing roofs with small stones, progressed from the simplest and most timid vault to the most complex and daring, each step in the progress involving changes more or less fundamental in the supporting walls, piers, and buttresses, and hence affecting the entire structural and architectural character of the buildings.

But it should be understood that a mere evolution of structure cannot in itself constitute a style of architecture. We have in modern times, an evolution of structure, which, like the Gothic art, consistently "broadens from precedent to precedent;" absorbing into itself all the inventions and discoveries of science in the art of building; but this evolution is in the hands of engineers; it appears in the steady and admirable progress of achievement in monumental works of severe utility, bridges, aqueducts, sewers, canals, embankments, factories. But this is not art, because unlike the Gothic evolution, it is not in the hands of artists. The function of the modern engineers, and that of the lay builder of the Middle Ages differ in this important respect: the one develops a theory of construction with a view to obtaining perfect fitness and stability in the most direct and economic way possible; the other, in like manner, aims at fitness and stability by the use of scientific and technical methods, but he confers upon his work beauty as well as fitness, grace as well as stability; he decorates his construction. A Cistercian abbey, in its austere, unornamented construction, shows how a work of engineering may be made a work of art. A Christian abbey is no more a work of art, because of its superadded luxury of sculpture and splendor of color. The modern engineer gives us prose, the Mediæval builder gives us poetry.

In the beginning of the period of the Renaissance — the Gothic tree having exhausted itself with blossoms — there was grafted into its enfeebled stock a new shoot, which, with the advancement of learning, and the growth of the human mind, gradually, but surely changed the character of the Mediæval forms, until at length they disappeared entirely. Indeed, so completely did this new influence take possession of the human mind, that after hardly a century of transition, the vast poetic monuments of Mediæval art became in the midst of the new civilization not only barbaric enigmas, but objects of insult and contumely. Even the antiquary neglected them, until the middle of the seventeenth century, while Inigo Jones was building a Corinthian portico on the west front of the old Gothic St. Paul's, of London.

This new principle of art was based upon an architectural formula, the Classic orders. This formula was the standard by which architecture henceforth was to be measured and corrected. If Mediæval architecture was a system based upon the free development of structural forms, that of the Renaissance was based upon authority and discipline. The Classic formula was recognized as the embodiment of the spirit of the antique world, by means of which alone, it was thought redemption from Mediæval barbarism, and revival of civilization were possible. The essence of this formula was an arbitrary system of proportion composed of isolated columns or attached pilasters supporting entablatures. The former were composed of bases, shafts, and capitals; the latter, of architraves, friezes, and cornices. Each of these divisions was further subdivided into mouldings, and as all these parts had developed together, and got their shape by mutual adjustment after many trials, as with the advancement of refinement artists became curious in respect to the shape and relative disposition of these subordinate parts, the result was finally the highest expression of architectural style known to mankind. Though this delicate and precise mutual adjustment might have been reached in other styles, as in Gothic, it has only been reached in the Classic, and the examples of it are the so-called orders of architecture. It is their advantage that they were developed in actual use — not by theory, but by practice — and that they grew into shape, embodying in their modifications the experience and feeling of successive generations of Greek and Roman architects. As they were received in the fifteenth century, they had undergone the final revision of the great Italian masters of the Renaissance, who studied their proportions with the last degree of refinement, and recorded them exactly. They conferred upon the coarse Roman orders a degree of perfection rivalling the perfection of the Greek orders. The ancient Romans, in taking their forms from the Greeks, had vulgarized them; but the Italian masters nearly restored the purity of the original type. So developed, these Classic orders are the key to almost all that has been done in architecture to our day.

Now the Classic formula thus revived and rehabilitated, because it represented perfection of proportion, could have no career of evolution in the Gothic sense. Perfection cannot be perfected; it can only be adorned. In fact, the essential principle of the architecture of the Renaissance is a scheme of decoration based upon a dogma of proportion.

To our present purposes it is important to observe that the invention and application of ornament to structure in process of evolution is a very different thing from the invention and application of ornament to a rigid formula of proportion. The consideration of this difference brings us at once to the point to which I would draw your attention.

"Architecture," says M. Veron, "even when considered from the æsthetic point of view, remains so dependent upon geometry, upon mechanics, and upon logic, that it is difficult to discover accurately the share our sentiment and imagination have in it." This is certainly true of Gothic art, because its character rests upon geometry, mechanics and logic, applied to the harmonious and consistent evolution of structure. But M. Charles Blanc observes of this architecture that "every structural necessity became a pretext for ornament, and the most capricious conceptions were in reality nothing more than contrivances for embellishing the work, forced upon the artist by the inexorable law of gravitation." This is equivalent to saying that Gothic art was an art of construction more or less ornamental. Now ornament is the product of sentiment and imagination, but the invention of ornament in such a service as Gothic art did not call for the highest artistic effort in this domain. The grouping of pinnacles upon buttresses, the filling of apertures with rich tracery, the fretting of sky-lines with crockets and finials, the decoration of wall surfaces with an embroidery of cusped arches and canopied niches — this sort of work was not the labor of illustrious masters, but of nameless trained craftsmen; nay, even the iconography and symbolism which crowded the porches were part of a hieratic system to which the men who produced it were in the position rather of humble catechumens or neophytes, than of independent artists. Their labors were didactic, like the labors of writers and printers. The composition of ornament for its own sake did not become a leading principle until a new style arose, based upon a rigid formula which was itself perfection, and therefore, as I have intimated, incapable of progression. Under these circumstances, the variety demanded of art by the newly-awakened civilization was only obtainable either by distorting or degrading the formula itself, as was actually done in the eras of the Baroque, the Rococo, the Churrigueresque, or by overlaying it

[1] A paper read before the Monday Evening Club, by Henry Van Brunt.

with ornaments not necessary to constructive effects — with constructive ornament, in fact.

It is evident that this process of decorating without degrading the unalterable Classic type could not have been effected by traditions, or by any such anonymous body of trained artisans as kept the Gothic evolution in a workmanlike track. The contingency called into existence the modern architect, with his books and prints and his archæological equipment. The composition and application of ornament demanded a new and higher quality of invention and imagination, because ornamentation had become a far more important function in architecture. In short, the Gothic method resulted in an impersonal art; the Renaissance method necessarily led to a personal art. If Gothic art was the development of principles of construction applied to meet similar requirements, each experimental abbey or cathedral differed from its predecessor in exact proportion to the progress in the art of building vaults with small stones, not in proportion to the genius of the master-builder. The decoration of these structures was not an essential incident in this scheme of general development. No single monastic or lay builder could impress his individuality upon this mighty advancing tide. Its progress was made up of forces far too great to be turned this way or that at his bidding. He was the servant of evolution, and not its master; he made the evolution consistent, grammatical and beautiful, and in this disinterested service his name and character were lost. In like manner, if the earliest artists of the Renaissance had discovered in the Flavian amphitheatre, (as the first Romanesque builders did at Spalatro), a new principle of construction, capable of indefinite expansion in the wider fields of the new civilization, instead of an order of architecture, and if Francis I had carried that principle back to France with the spoils of his first Italian conquest instead of a crowd of Italian artists, the guardians of the ancient formula, we might have witnessed the phenomenon of another impersonal art, to the development of which, in the course of time, the genius of Philibert de Lorme, Pierre Lescot, and the Mansarts would have done loyal but anonymous service. If on the other hand, in the twelfth century, it had been possible to invest a certain form and proportion of vaulting and abutment with such peculiar sanctity that it would have been impious to vary from it henceforth in any essential particular, decoration would have at once assumed the first, instead of the subordinate place in the architecture of the thirteenth and fourteenth centuries, and, instead of a series of nameless masons and master-builders, we would have had a catalogue of individualities as illustrious and specific as that which confers its peculiar personal interest on the history of the Renaissance.

Now as to the evidences of the personal character of Renaissance art. Although the Classic formula was set up and accepted as absolute authority in the fifteenth century, although it has been used with veneration for four centuries up to the present time, and although every architect designing in the style of the Renaissance intends above all things to be *correct* in his use of this simple type, the result has been not monotony, not cold and colorless uniformity, but a variety of expression, hitherto unknown in art. Now in studying these variations as they are exhibited in the buildings of the Renaissance up to the present day, we shall find that they are not capricious or accidental; there was one class of variations in France, one in England, one in Germany, one in Spain, one in Holland, one in Italy. These distinctions of class are easily recognizable: they follow natural laws, they interpret national temperament or genius by a visible demonstration. Thus the French Renaissance abounds in elegant variety; it is nearly always refined, delicate in detail, and full of feeling and animation. The English Renaissance is for the most part unimaginative and heavy, feeble in invention, prosaic and dull; but it was not without its single era of great and original development, at the hands of Wren, after the London fire. The German follows the French at a great distance; where it has not been merely imitative, its principal characteristic has been cold correctness and pedantry. The Spaniard handles the orders with great freedom, and overlays them with a sort of barbaric but ungrammatical splendor, which is almost Oriental in its profusion and color. The Dutch variation was homely and honest, like the people. But in Italy the natural birthplace of the Renaissance, Vignola, Serlio, Palladio, Bramanti, Scamozzi first taught the world how true artists, holding alike to a rigid formula, could invest it with purity and delicacy; how they could be correct without dullness, precise without pedantry, poetic without license. These were the earlier Italian development; the later masters, betrayed by the contortions of Borromini, the undisciplined inventions of Bernini, the coarse magnificence of Michael Angelo, lost their purity in profusion, and vulgarized the type in their passion for grandeur. Still the Italians were always the true masters of the Renaissance, and the rest of Europe went to school to them. But we have seen that though the architects of France, England and Germany tried to imitate the Italian manner, they were always French, English and German; the national spirit betrayed them. All the forces of art were united in the desire to make the revised Classic forms cosmopolitan. They studied the same authorities, learned by heart the same formulas of proportion, copied the same monuments, but failed in their efforts to make a universal architecture. Indeed, there was not only a national impress left upon their works, but no two architects of the same nation could produce similar work. Each interpretation had a character of individuality; the phenomenon remains true to this day.

A late writer very happily said that "architecture tells us as much of Greece as Homer did, and of the Middle Ages more than has been expressed in literature. Yet," he adds, "it has been silent since the thirteenth century." This latter proposition is after the dogmatic fashion prevalent in modern English criticism. It is equivalent to saying that the personal equation in modern architecture, rendered necessary by the adoption of a formula as the basis of design, has prevented the art from exercising its natural function as an evidence of contemporary history, as it did when design was confined to the development of a theory of construction, in the series of Greek temples and mediæval cathedrals. The fact is that architecture, whether personal or impersonal, cannot be forced away from this function, even by the most determined exercise of the modern privilege of masquerading in the trappings of old forms of art. Indeed it is sufficiently evident that this very personal character imposed upon architecture by the conditions of the Renaissance, in rendering it more sensitive to exoteric impressions, has made it a more accurate exponent of the quality of the civilization which produced it than has been the case with any form of impersonal art, the characteristics of which must be largely due to internal forces. It is not so much its structural as its decorative character which makes the metropolitan cathedral a reflection of the life which swarmed about the market-place under its shadows, or entered its porches with banners. But if we survey the progress of mediæval French architecture from the time of Philip Augustus, in 1180, to that of Charles VII, in 1422 — from St. Bernard of Clairvaux to Joan of Arc; though in this era more than sixty cathedrals of the first class were built, involving an expenditure of more than $500,000,000 in our money (an activity in building operations unsurpassed in history), we shall find that no monarch and no court was able to impress upon it any characteristic which should enable us to distinguish any one phase of its progress as the style of Louis VIII, the Lion; or Louis IX, the Saint; of Philip III, the Hardy; or Philip IV, the Fair; of Charles V, VI, or VII. There are no such styles; the art of these reigns was an evolution of forces, and, as such, it was an impersonal art. If any phase of this evolution is identified by the name of a sovereign, this is purely a matter of convenience in nomenclature; it is not significant of cause and effect, for the art refused to submit to the caprices of any court.

On the other hand, when architecture had ceased to be a structural evolution, and was based upon a formula of pilasters and entablatures, enclosing imposts and arches, decoration, ornament assumed a function until then unknown, and there was a distinctive style corresponding to the character of each reign, often contrasting with curious abruptness. Thus we recognize a style of Francis I, free, elastic, poetic, romantic; of Henry IV, bold, coarse, grotesque, of Louis XIV, full of grandeur without, of pomp and splendor within (Viollet-le-Duc has called it "the new Renaissance"); of Louis XV, frivolous, licentious, ostentatious, Rococo; of Louis XVI, decent, orderly, pure to prudishness; of the first empire, a theatrical display of imperial Roman properties, meagre and tarnished; of the second empire, elegant, but profuse and luxurious, drawing its *motifs* from every historical source, but harmonizing them with a fastidious academical spirit; a style of to-day, too near to us to be recognized now in just perspective, but for which we will be held responsible in the next century. So there is a style of Elizabeth, of the Stuarts and Tudors, of bloody Mary, of Queen Anne, and of Victoria. So also in Spain, as Fergusson says, the enthusiasm and exultation and pride of Ferdinand and Isabella, and of Charles I are well expressed in the architecture of their times, until Philip II substituted, for the joyous and sunny exuberance of his predecessors, a cold, academical formalism, in full sympathy with his iron rule.

This scenic display is rendered possible by the fact, that the architecture of these eras must necessarily be saturated with the subjective personality of the architects, in order to its proper adjustment to the spirit of the times. In fact, the composition of ornament is like the composition of poetry; neither can be evolved from theory alone; neither can exist in definite shape save by virtue of the individual character, attributes and mental equipment of the author. It is his genius which confers upon it all its specific quality. It is his knowledge, his training, his convictions, his taste, which so adjust ornament to a formula of proportion as to confer upon it especial character and interest. It is true that a large part of Renaissance ornament, as of all architectural ornament is conventional. The enrichment of the order is obtained not only by the imaginative arts of sculpture and painting, which must necessarily be infused with personal genius like a poem, but by ornament of convention, which is common property, *i. e.*, certain types of ornament applied by general acceptance to the decoration of the mouldings, and other details of the order; but it is also obtained by a certain hardihood in varying its proportions. But the use of conventional ornament implies choice, discretion on the part of the architect, and these are surely personal qualities, and the variation of the proportions is an appeal to his academical training, to his knowledge of precedent, to his artistic feeling. If an ignorant man plays with proportions, the result is inevitably disgrace and vulgarity. He can produce successful results, only by an abnegation of himself, and is only acceptable when he follows the Classic formula with unimaginative fidelity. It is only the scholar who can handle his orders with freedom. The advancement of archæological learning, the accumulation and accessibility of architectural precedent, in making it impracticable to the modern architect to build better than he knows, have inevitably forced him into an increasing degree of self-consciousness in his work, and in depriving his work of the grace of innocence and naïveté, have made it a more sensitive index of his individuality. The picturesque and romantic days of an impersonal architecture will return no more.

A SKETCH OF THE HISTORY OF ARCHITECTURE.[1]






IT is not possible to determine the exact date when the Hellenic nation, no longer connected with the Pelasgic tribes of Asia, began upon the outlines and ideas collected by their forefathers, to perfect a style of architecture for themselves, suited to their character, religion and climate; to complete that great work, the foundation of the art to which nation after nation had been adding its portion for a period of no less than three thousand years. The very earliest structures that have any claim to the term "art" are discovered in Egypt, and date as far back as 3900 years B. C. It was then the inhabitants first conceived the idea of erecting for their chiefs and rulers indestructible edifices, wherein the embalmed bodies might repose, undecaying, in security and peace, until they should again be called into life, as their traditions led them to believe would ultimately be the case. It is interesting to trace the advancing steps through the centuries that intervened between this early date and the time of which we write. The research carries us up and down that mysterious country, Egypt, about whose early history so little is definitely known, and of which so much is conjectured, and we contemplate with awe and amazement the great monumental excavations, elaborately decorated with hieroglyphics, by which each chief sought to hand down to eternity a record of his good deeds. As time proceeds, we find in place of rock-cut tombs enormous temples, gigantic pyramids, and lofty obelisks, and in each is seen an ever-increasing development of what may truly be called the germ of art. The authors are taking Nature as a copy, using pillars and columns roughly cut to represent bundles of reeds, and the tops of these are gradually formed to represent the well-known lotus-flower and other leaf forms common to the country. But as the glory of the monarchs of Egypt began to decline, the art was taken up by the Assyrians and Chaldeans, nations whose countries were at no very great distance from Egypt, and whose principal commercial enterprises were carried on with that country. Here have been found temples of a character very different from any previously erected: buildings carried to a great height, instead of being all of one story. The decoration, too, is of a type that we have not met with before. The Chaldeans were a people devoted to the worship of the heavenly bodies, and they decorated their temples with the colors assigned to each of the seven planets to which they were dedicated. Their sacred enclosures were not surrounded with solid walls, but with simple, lofty columns, standing singly at a distance of many feet apart. But the Chaldeans, also, wise in all the mysteries of the unseen future, were destined to perish utterly from the face of the earth. From Chaldea we are led northward and westward, and through the entire length of Asia Minor, and in the examples now at our feet we find the immediate forerunners of the Grecian art.

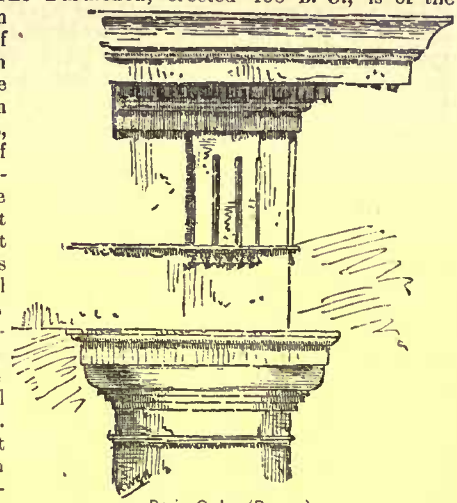
The Pelasgic races of Asia Minor and of Greece were intimately connected in friendly relationships for many centuries, until the Phrygian Prince carried away the beautiful Helen from Sparta to Troy, which outrage brought about a deadly animosity between the two countries, that took many years to die out. From this date, nearly five centuries, occupied with civil war, elapsed before any farther advance in the progress of the art can be noticed. Greece had been inhabited by numerous tribes, and the Hellenes proper had originally been but one among the many. Gradually they gained a reputation above that of any other tribe, and finally acquired an influence over the whole country to such an extent that all the other tribes became assimilated to them.

By the middle of the seventh century B. C., mere utilitarian architecture was giving way to more ornate erections, and when the country was at peace, and the Greeks were able to turn their attention to the arts of peace, many forms of great beauty were already discovered, and there were many examples of construction for them to improve upon.



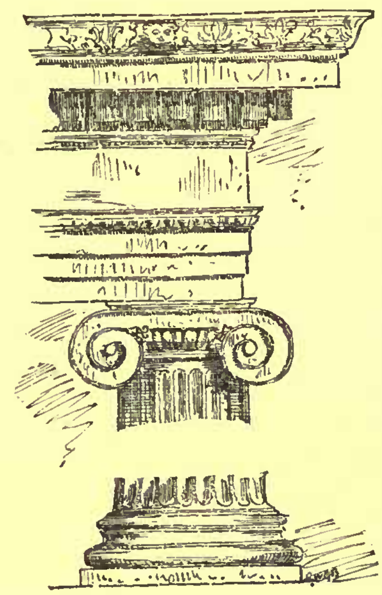
Even so far back as 2000 B. C., at Beni Hassan, in Egypt, pillars had been constructed of a decidedly "Classic" form, and the Beni Hassan type was greatly improved upon by the architects of the great temple of Karnac, and it is difficult to refuse the evidence these examples give of the origin of the forms adopted by the Greeks. The earliest example of Grecian architecture of this kind appears to be of the date 650 B. C., and is the temple of Corinth. Very little of this now remains, but there is sufficient to show how extremely massive and ponderous it was. Next in time comes the temple of Ægina, probably a century later. But the temple of Theseus, at Athens, constitutes a link between the Archaic and the perfect age of Grecian art, more perfect than the temple of Ægina, but not so perfect as the Parthenon, its near neighbor in locality and date. The Parthenon, erected 438 B. C., is of the Doric order, and is an excellent example of true proportion in every particular. The height of the column is 6.025 diameters, which is an increase of one and one-half diameters upon the height of the earliest example, the temple at Corinth. With this order, sculpture and painting are essentially connected. The metopes, the face of the pediments, and other features were all carved and colored. This was the height of perfection to which the Doric order attained, and from this date its decline began. The attenuation of its columns and the diminished height of the entablature are among the principal features of its decay.





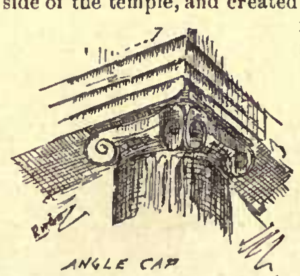
Doric Order (Roman).

The Ionic Order, growing out of the declining Doric, takes up the lofty, slender columns, and gives them a proportion and perfects a style to suit them. This new order is much more complete in itself than was its forerunner, and depends less upon the assistance of color to relieve the dead stone. Those ornaments which in the former were merely painted, were in this cut and carved. The scrolls which had so long been in use as a decoration, both in paint and cut in wood or cast in bronze, were in this style brought forward and placed in a most conspicuous position, and were made to form the principal feature of the capital. A base was also given to the columns, but like all other details, of which the Greeks strove so earnestly to make us believe they were the originators, these bases have their antetypes in Egyptian temples erected fourteen hundred years before. The best example of this second order is the Erectheum at Athens, built 409 B. C. The original Ionic capital was never made to suit pillars in every position; it answered admirably so long as only a front view was obtained, but when placed at the angles of buildings, and two sides were seen, the architects had a difficulty before them which required an immense amount of study to overcome. The capital was originally square on plan, with the volutes at the front and back and abutting on the sides, so that at the side of a temple there would be some score of columns with their voluted capitals facing the spectator, but the capitals at each end, having their voluted faces parallel with the front and back walls, presented their sides to the side of the temple, and created a discrepancy and formed an eye-sore most distressing to the painfully symmetrical Greeks. The first attempt to improve this was to make a capital for the angle of the building, with two faces, and where the volutes met they butted at each other until each was forced beyond the base line at an angle of 45°. This was so obviously a makeshift, that although an ingenious way of overcoming the difficulty, it did not satisfy its authors, and after many attempts, which still exist, their efforts were finally rewarded, for they produced a capital very beautiful in its form and thoroughly adapted to its work in all positions. The arrangement was a square, having its sides all curved alike.





BASE, BC 500. PERSIA



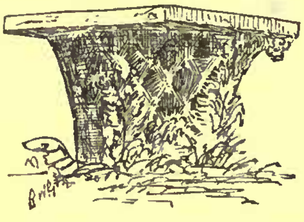
ANGLE CAP

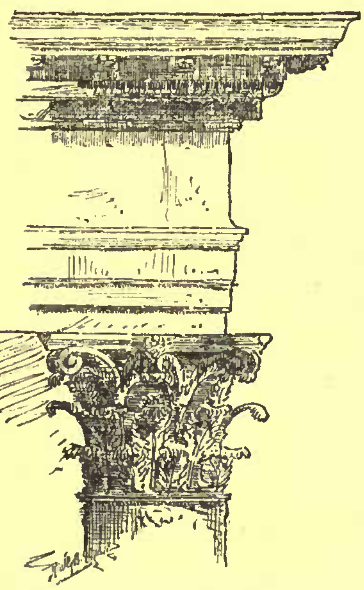
The suggestions as to the origins of these two orders, given by Vitruvius, are as ingenious as they are innocent. He writes, "Ion,

[1] A Sketch of the History of Architecture from the commencement of the Grecian Art to the Reformation in England, by R. W. Gambier-Bousfield, A. R. I. B. A.

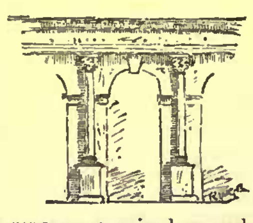
the son of Xuthus, building a temple to Diana, and seeking some new manner to render it more elegant had recourse, as before in the Doric, to the human figure, and gave to this new order a feminine delicacy." "That its appearance might be more lofty, he added a base in imitation of a shoe. The volutes, like the plaits of the hair hanging on each side, he gave to the capital, ornamented with fruits, or festooned in flowers; and furrows or flutings were wrought down the columns, resembling the folds or plaits of a matron's garments. Thus he invented two kinds of columns, in the Doric imitating the manly, robust appearance without ornament, in the Ionic regarding a female delicacy, accompanied with ornaments pleasing and elegant."

Vitruvius also gives a romantic origin for the Corinthian capital, and this is still held by many to be the correct story, but if we examine the existing examples we shall find that the earliest are unlike Vitruvius's prototype, and that in reality this third order grew out of the preceding one, and was perfected through many years. "A marriageable young lady of Corinth fell ill and died. After the interment, her nurse collected together sundry ornaments with which she used to be pleased, and putting them in a basket placed it near her tomb, and lest they should be injured by the weather, she covered the basket with a tile. It happened the basket was placed upon a root of acanthus, which in spring shot forth its leaves. These running up the side of the basket, naturally formed a kind of volute in the turn given by the tile to the leaf." "Happy Callimachus, a most ingenious sculptor, passing that way was struck with the beauty, elegance, and novelty of the basket surrounded with the acanthus leaves, and according to this idea or example, he afterwards made columns for the Corinthians, ordaining the proportions such as constitute the Corinthian Order."

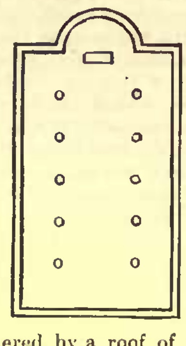




The Corinthian order was only introduced into Greece on the decline of the art, and it was left for the Romans to perfect an order, which in Greece never rose to the dignity of a temple order. For the capital the curved abacus of the late Ionic was used, and the bell-shape discovered to have been in use by the Egyptians was here introduced. To this they applied the acanthus, in conjunction with the Assyrian honeysuckle, the latter supporting the scrolls at the angles. But to see this style in its perfection we must leave Greece and cross over to Rome. The form of the Greek temples was undoubtedly of Egyptian origin. Small peristylar temples were erected as early as the eighteenth century, B. C., and are common to all ages. The finest example of the so-called Corinthian order, then, is the temple of Jupiter Stator at Rome, which in richness and proportion, surpasses anything hitherto designed. But in the architecture of the Romans we have a great change. The true Roman order was an arrangement of two pillars placed at a distance apart, bearing a very heavy entablature, which in consequence of its length had to be supported in the centre by an arch springing from piers; the columns were raised on pedestals and placed in front of the piers. The arch was by no means a new method of construction, though hitherto it had only been used as a necessity, and not as a feature. Looking back again to the Pyramids of Egypt, which date from nearly 4000 years B. C., we find arch forms of the rudest construction, but perfectly adapted to their uses. Here is to be seen the pointed arch and the semicircular, as well as the simplest constructive arrangement — two large straight stones, raised one against the other over a space. It is true that the arches were all built with horizontal beds, and that the radiating bed was not known for centuries after, but the pointed arch to a drain or aqueduct at the Great Pyramid, and to the tombs in Asia Minor, are as true in outline as those of Christian churches. But to return; in a few years time the piers supporting the arches were done away with, the pillars taken down from their pedestals, and substituted for the piers, the arch sprang from the top of the columns, and the entablature was placed at a greater height above the crown of the arch. The characteristic of Roman architecture is the exaltation to importance of plain surfaces, and the subjugation of the order to them. The rectilinear form of plan was preserved



for a time, but where the architects were not confined in space, their plans exhibit a great amount of irregularity, and even circular temples were attempted, and successfully carried out. Roman temples were extremely insignificant as compared with other buildings in their cities, and our attention is turned to the Government Halls — the Basilicas — which were considered of far greater importance. These were long, lofty buildings, principally rectilinear, but generally finished with a semicircular apse constructed in the centre of one end, in which were arranged the seats for the judges. An altar stood at the junction of the apse, and the main building at which those religious ceremonies were performed, which opened and concluded all public business. The main building was divided in most Basilicas into aisles by pillars and arches, but in some cases it was left clear, and the entire space covered by a roof of one span. These roofs were generally of wood, and of simple, utilitarian design. But what is this form of plan that we are describing, other than the origin of all Christian churches?



THE ILLUSTRATIONS.

PAXON & COMFORT'S BUILDING, PHILADELPHIA, PA. MESSRS. W. EYRE, JR., & W. E. JACKSON, ARCHITECTS, PHILADELPHIA, PA.

SKETCHES AT MANCHESTER-BY-THE-SEA.

PROPOSED CHURCH, PATERSON, N. J. MR. CHARLES EDWARDS, ARCHITECT, PATERSON, N. J.

HOUSE FOR A. R. SMITH, ESQ., BIRMINGHAM, CONN. MR. C. H. STETSON, ARCHITECT, NEW HAVEN, CONN.

POZZI E PIOMBI: THE PRISONS OF THE VENETIAN REPUBLIC.

. . . . Livida l'onda,
Che tra l'infausta reggia e le prigioni
Languidamente sta, geme sospesa
Sulle misere teste, e chiude l'eco
Che sol ripete del dolor le voci.

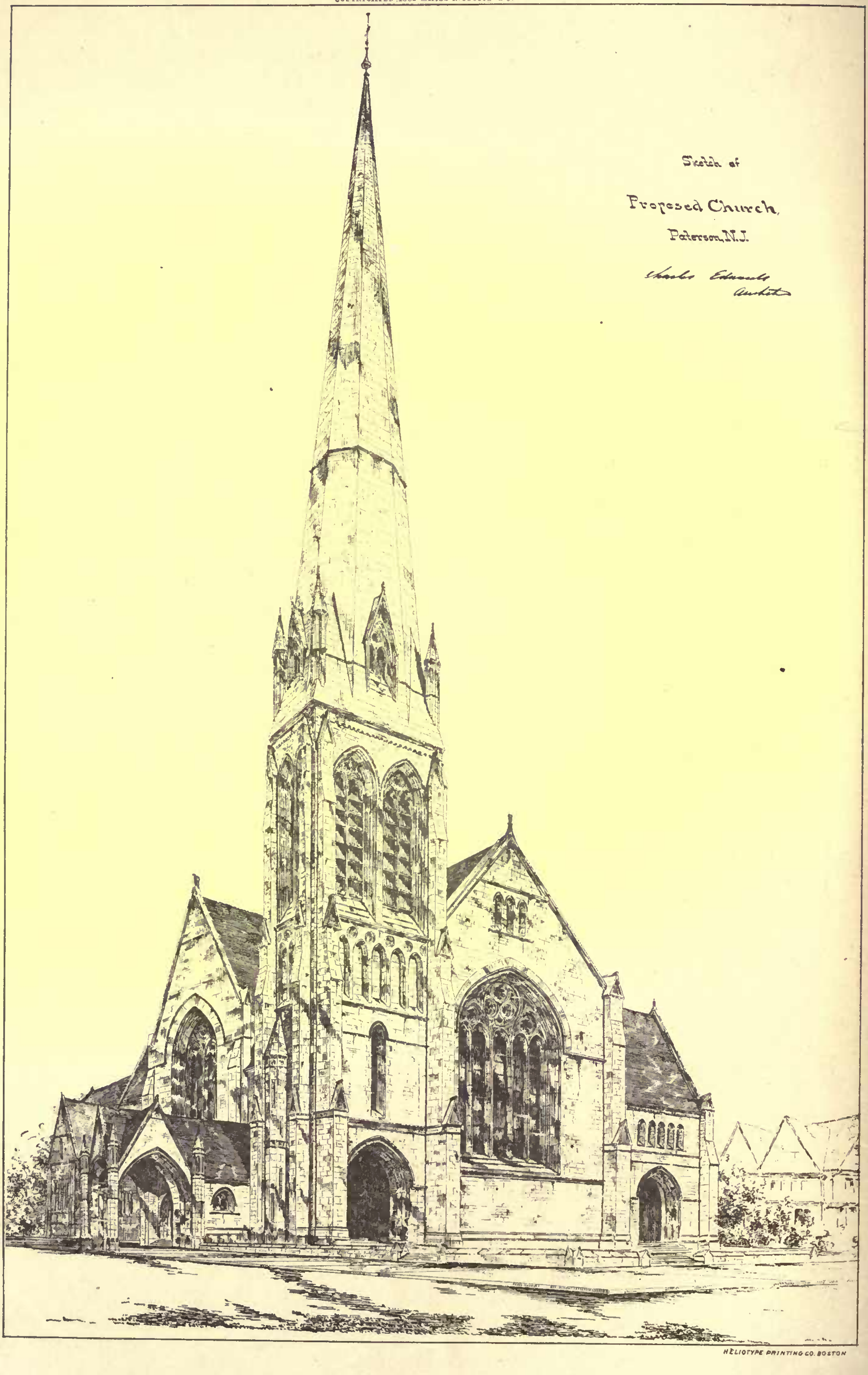
(*Antonio Foscarini, a tragedy by G. B. Niccolini, Act I, Scene IV*).



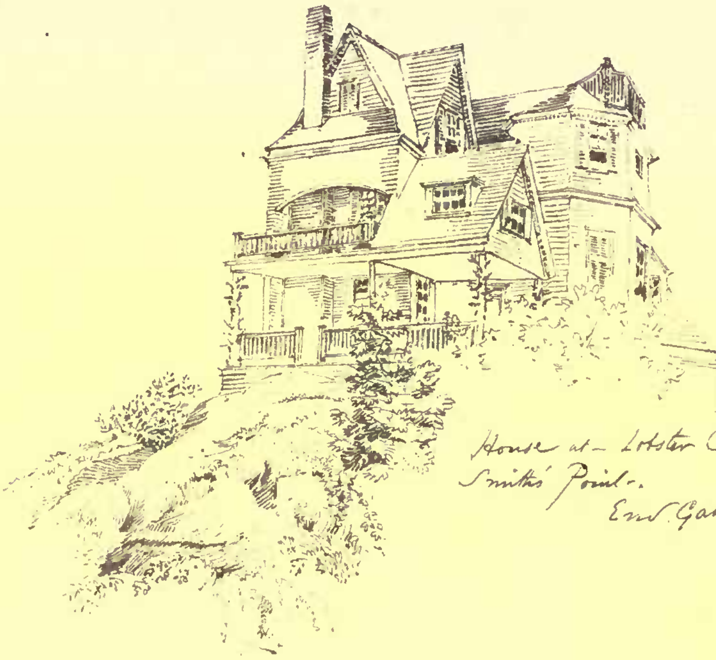
THE Republic of St. Mark having fallen in the fervor of the Democracy, the citizen Melancin proposed that the total destruction of the dreadful prisons, the Pozzi and Piombi, and also of the boxes for secret denunciations, should be decreed, and that the lions should be knocked to pieces, that the sight of them as emblems of a blood-thirsty régime, might not give uneasiness to the people in this new and joyful era. The citizen Widman applauding the proposition, added that he, having gone, together with other citizens to inspect those infernal places, had learned from the old custodians that by the ex-inquisitors two unfortunates had there been walled-in alive, some time before.

One might expect that the horrified assemblage would have run in mass to demolish the wall which closed the door, and gathered the remains of the supposed victims, but it is not believed that such a thing took place, because until now the above-mentioned door, or more precisely two of the doors in the prison are still sealed by single slabs of stone, forced against the lintels by iron wedges, and have the appearance of having been so closed for some hundreds of years.

He who visits the prisons of the Ducal Palace, which belonged to the Council of Ten, and are now called the Pozzi, mounts the loggia on the first floor inside the court, and trusts himself to the care of a guide, who, taking an oil lamp, precedes him into a dark room, and down a small staircase, leading to the first tier of cells. In order to enter these, one must stoop, the doors being rather low; over every one of them there is a hole, through which the food was handed to the prisoners; one of the cells still shows the wooden sheathing of the walls, with a small shelf and the plank which served as a bed. Having turned the corridor, the guide reaches the staircase leading to the lower cells, and if he fulfils his mission conscientiously, he numbers with measured cadence the thirteen steps, so as to create the impression of sinking under ground, and reaching the prisons which are supposed to be below the level of the canal. We enter one of the cells, then another; we read some of the inscriptions that the prisoners have scratched upon the walls; our attention is called to the fact that every door was closed by double iron shutters; we are told we enter the prison of Carmagnola, and that one in which the Doge Faliero was imprisoned. At the end of a corridor, feebly lighted by a small aperture, something resembling a step is pointed out to us; and we are told it is the place where the strangling and beheading was performed, by means of a machine, of which some traces remain upon the walls. Into a niche, a crucifix was placed, to which the condemned prisoner could cast his last look; the inclined pavement ends with a slab of stone which has several perforations through which, when the



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House at Lobster Cove
Smith's Point.
End Gable.



House at Lobster Cove
Smith's Point. Manchester.
Mr Arthur Little. Archi



The Fort House.

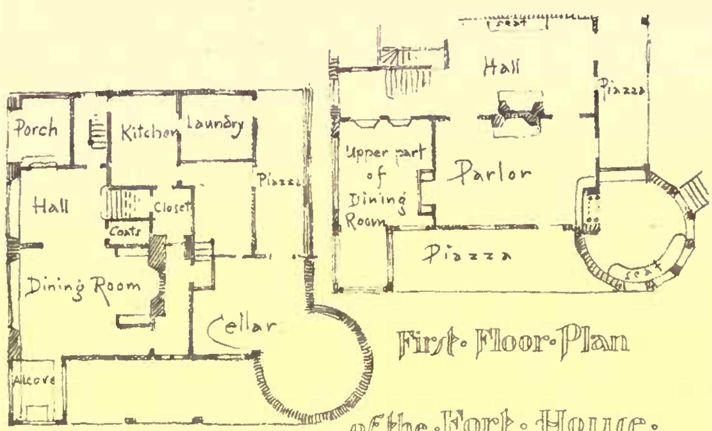




Distant Sketch
of the Fort House.



HELIOTYPE



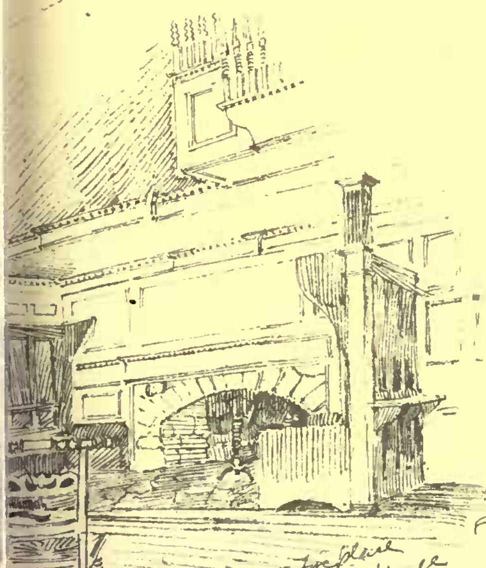
Basement Plan

First Floor Plan of the Fort House



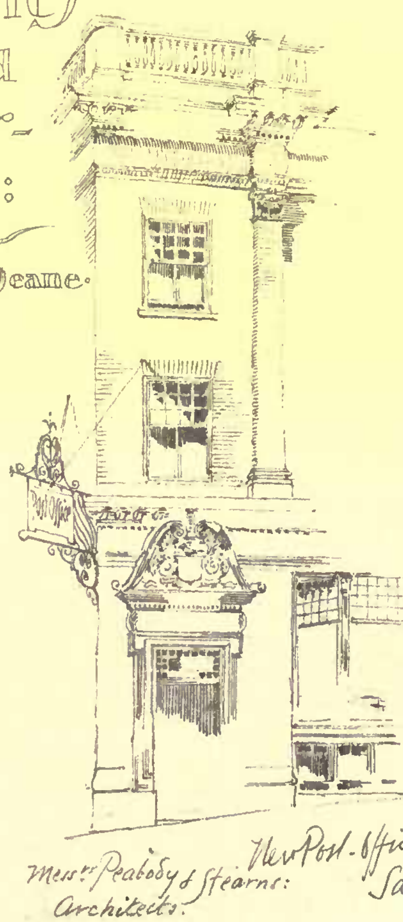


Home of Mr. Pain. Beverley Farms



Hall & Fireplace The Fort House

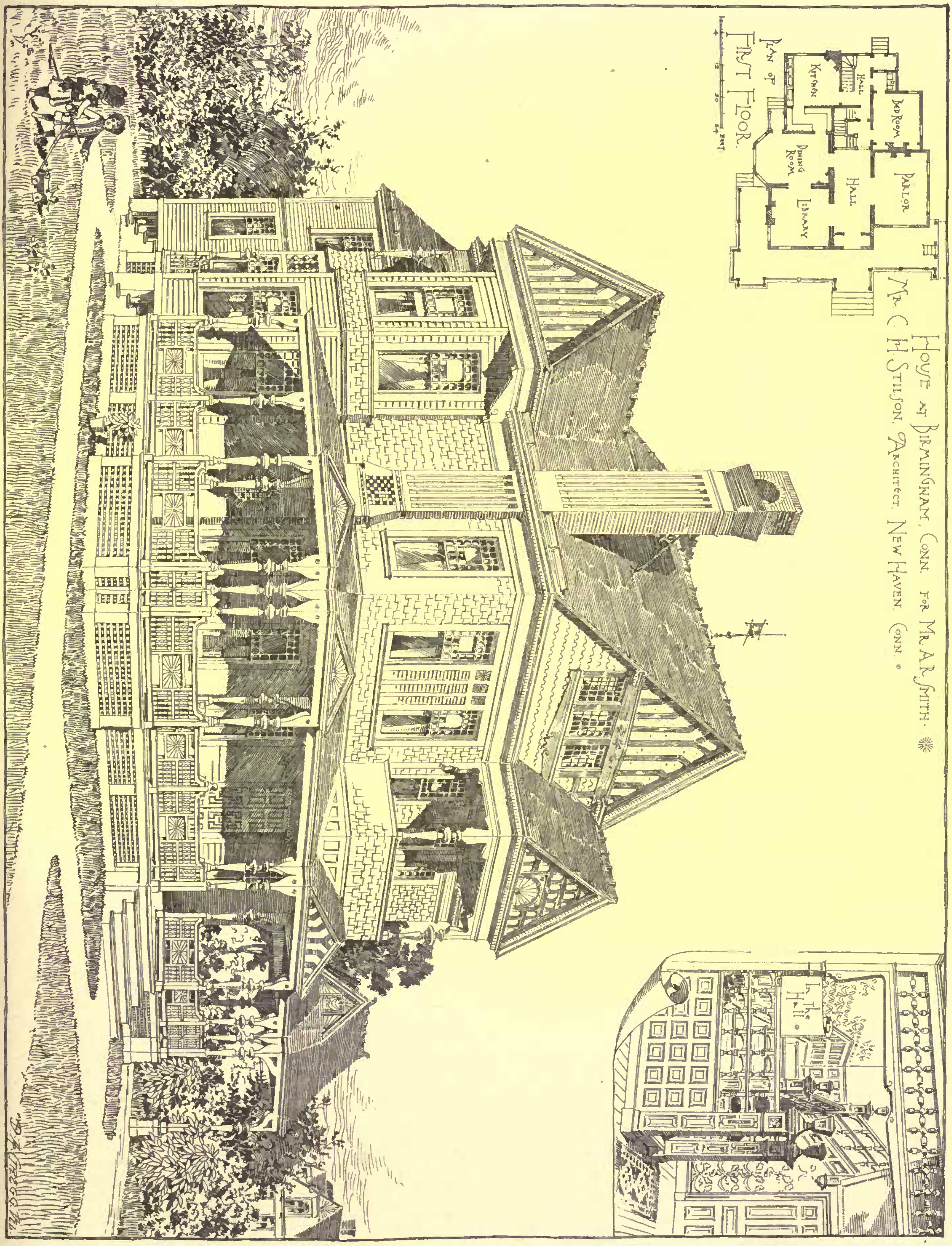
Pencil Sketches in and around Manchester-by-the-Sea: Mass: by E. Eldon Deane



Messrs Peabody & Stearns: Architects. New Post-Office Salem.



Stables & the River Fort & Barn Houses. Mr. Arthur Little. Archt.


House at Birmingham, Conn. for Mr. A. R. Smith.
Mr. C. H. Stilson, Architect, New Haven, Conn.
Plan of First Floor.
Kitchen
Hall
Bed Room
Dining Room
Hall
Parlor
Library
In the Hall.

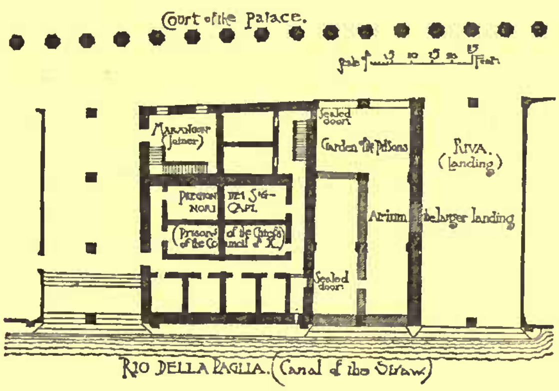
operation was finished, the blood of the victims flowed, and through the door, which is close by, and now walled up, the miserable remains were carried out.

When he has given this last information, the guide silently retires, in order not to disturb the incubus which he has succeeded in awakening within our souls. But we went down in imagination only, and will remain there alone to complete our investigations.

It should be time to make an end of the fables, and it would cost but little to confute them, if it were not for the closed doors, which attract even the attention of the visitor who has no prejudice whatever. When the men of the Revolution, having seized the Palace, entered the Pozzi, they must have stopped before these doors, and with excited fancies believed the cruel legends, which, not corresponding with the ideas of justice of the Venetian Republic, were afterwards rejected.

As we said, two doors at the extremities of a corridor are sealed with slabs of stone forced by iron wedges against the jambs. The frame-work of all the doors is of Istrian stone, but in the doors which are not sealed the lintel is cut at each end, so as to permit it to drop between the jambs, thus preventing them from falling together; while it simply rests upon the top of the sealed doors, thus indicating another construction. The outside of every lintel of the cells is engraved with a Roman number, while no such thing is found on the sealed doors. Looking at the brick wall we perceive that the sealed doors were cut after it was built, and any person having knowledge of construction will recognize the cutting of the old bricks, the small portions of the new brickwork used to fill up the break, and the smoothing of the new plaster.

Let us now go to the Canal della Paglia, to observe that portion of the façade of the palace, to which correspond the above-mentioned



prisons. They are comprised between the two large landings; one of the diamond-pointed stones, decorating the basement of the palace, is cut into a window, and it is through it that light is admitted into the corridor of the lower prison. In this same corridor are the sealed doors, which being cut in the wall on the side of the larger landing, once gave admission to its atrium. A most curious and puzzling thing! and in order to explain it we must study the plan of the place. A plan which is directly to the purpose is one drawn in the year 1580, when the new prisons were to be erected upon the opposite side of the canal, and kept in the Library Marciana. On this plan, the Pozzi are inscribed "Prisons of the Chiefs of the Council of Ten," and we see also there, that the two doors communicated with the atrium of the landing; in the drawing one-half of the atrium is closed, and divided by partitions on which is written "*Garden of the Prisons.*" The other half of the atrium is open, and inscribed "*Riva*" (landing).

The existence of the two doors in the wall separating the prisons from the atrium may now be explained. We know that the Garden was the mildest prison of the Ten; the name was perhaps given to it as a jest upon its mildness, being airy and light, while the cells were all in darkness; so we find on the 30th of April, 1599, one Ser Zuane Boldri imploring the chiefs of the Council to be returned to the "*Giardino,*" from which he had been taken and put *al scuro* (in the dark). We may therefore believe that, when about 1550, this portion of the Palace was built, and with it the prisons of the Ten, which were afterwards named the Pozzi, it was found there was not space enough to put the prisoners while the cells were being aired, and that they stood in need of a commodious landing upon the canal. One-half of the large atrium, which is close by, was therefore closed, and through the old partition-wall the two doors were opened, one of which led to the "Riva," and the other one gave admission to a large room, which was named the "Garden." In the beginning of the seventeenth century, when the new prisons on the opposite side of the canal were built, the atrium being then reopened, the two doors were closed as we find them. The doors were made to meet the ordinary wants of a jail, and with the intention of giving an airing to the prisoners; both the art of opening and closing them afterwards when the new prisons were built, tells us of a human feeling which accompanied the inflexible justice of the Venetian Republic.

In order to ascertain the level of the lower prisons, I measured the height from the pavement of the corridor to the small aperture made in the diamond-pointed stone of the basement of the façade on the canal; and comparing this measure with that of the outside from the same window to the high-water mark, I found that the pavement is one metre and five centimetres above it.

Nicolini, the tragic writer, who, together with so many poets and historians of the beginning of the century, contributed to disseminate among the general public erroneous ideas concerning the Venetian Republic, which had fallen but a short time before, wrote regarding these prisons: —

> . . . . "The livid wave
> That lies languidly between the palace of evil omen and the prisons
> Sighs suspended over the miserable heads, and shuts out the echo,
> Which repeats only the sounds of sorrow."

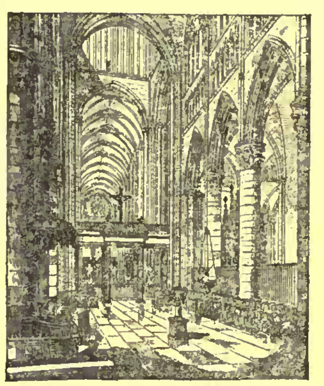
These writings will however retain a value for their poetical beauty, and remain as evidence of the current ideas of the writers, as Sterne called Locke's "*Essay upon the Human Understanding*" "a history book of what passes in a man's own mind." But if there is any one left who believes the prisons are under ground, or even on a level with the canal, he may convince himself they are on the same height as the pavements of the atriums, and therefore higher than most ground floors of buildings of the present day; yet see what absurdities have been current about them!

And fancy was not only at work about the closed doors, but as we said before, the cells acquired new importance through the names which were given them: it might not be superfluous to say that the Count of Carmagnola was shut up in the Forte, a prison which was on the sea side of the palace, over one hundred years before the prisons of the Ten were built, and that the Doge Faliero was still one century anterior to Carmagnola.

The step of the corridor, and the holes in the walls are traces of a railing to shut off the head of the corridor; in the small niche a lamp was placed, there were also many others for the purpose of lighting the prisons; and through the holes of the stone beyond the railing, the daily cleaning was accomplished. A lamp, a railing, and something else should not seem out of place in a prison.

Giacomo Boni.

THE RIGHT OF SANITARY AUTHORITIES TO RETAIN BUILDING PLANS.



The Nave, Rouen Cathedral, France.

One of the most important points affecting the interests of the building trade and of building owners that have for a long time occupied the attention of a court of justice arose in the action of Gooding *vs.* the Local Board of Health for Ealing, tried a few days ago in the Queen's Bench Division, before Mr. Justice Mathew, without a jury. In April of the present year, the plaintiff in the action contemplated the erection of some shops, houses, and a lecture-hall in the Broadway, Ealing, and he accordingly sent plans of the proposed buildings to the defendants, and also gave notice to the defendants of his intention to erect the buildings. The notice was given on a printed form supplied by the defendants, at the bottom of which was a foot-note: "See Regulations over." The plaintiff signed the notice, and observed this foot-note, but he did not read the "Regulations" referred to by it. On the back of the notice was printed a "Regulation" in these words, "All plans deposited will be retained in the surveyor's office for record." The plaintiff had also signed similar notices before. The defendants disapproved of the plaintiff's plans, and he was informed by them of that fact; but he was not informed by them in what respect the plans had not conformed with the by-laws, and when he wrote to them asking for information on the subject, they refused to give any such information. The plaintiff then demanded a return of his plans, and as this was also refused, he brought an action for their detention, and the question arose at the time whether an Urban Sanitary Authority, acting under the Public Health Act, 1875 (38 and 39 Vict. c. 55), has power to retain plans, although they may have disapproved of the erection of the contemplated buildings. The sum to the paid to the architect was stated to be about £150; but this sum included his commission, and it did not appear what the cost of the plans alone would have been. It was contended on the plaintiff's behalf that there was nothing in the Act just mentioned which would give the defendants a right to retain the plans. The one hundred and fifty-seventh section of the Act empowers every urban sanitary authority to make by-laws respecting new buildings, and to provide for the observance of such by-laws by enacting therein such provisions as they may think necessary, as to, amongst other things, the deposit of plans and sections by persons intending to lay out streets, or to construct buildings; but this section, it was argued, gave no power to make a by-law which would deprive an intending builder of his plans altogether, and it was further urged that the "regulation" under which the defendants claimed the right to retain the plans was not contained in any by-law, and could not, therefore, have the force of a by-law. It was likewise contended that, although it might be reasonable that the

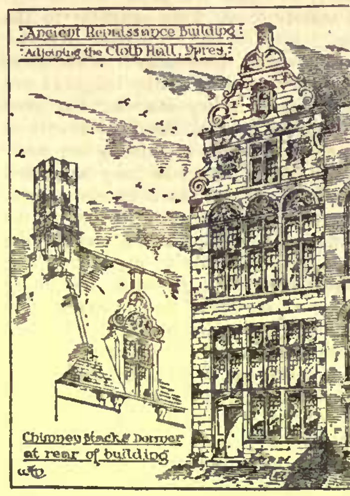
defendants would have power to retain the plans for purposes subservient to the Act, as, for instance, if they approved of them, to see that the work was carried out in accordance with them, it was not reasonable that they should retain them when they had disapproved of them.

Mr. Justice Mathews was, however, of opinion that the "regulation" at the back of the notice as to the retention of the plans, was sufficiently brought to the plaintiff's attention, and that the provision made by it was reasonable. Judgment was accordingly entered for the defendants with costs.

We are unable, whilst entertaining the fullest respect for the learned judge, to regard this decision as being otherwise than erroneous and eminently unsatisfactory. The plaintiff has, we believe, since the action was commenced, sent in other plans, which the defendants have approved of, and has constructed his buildings, so that it is possible that the case may not be carried to a higher court; but the question involved is, nevertheless, of such general interest and importance that we deem it desirable to direct special attention to it. If the decision of the learned judge in this case be correct, builders and building-owners in general may find themselves exposed to the infliction of a serious burden; for, what one sanitary authority may legally do under the statute referred to, all other sanitary authorities may likewise do.

We cannot but think, however, that the real issue in the case now under consideration was seriously obscured — if indeed it was not almost entirely lost sight of — in consequence of the introduction of questions of secondary importance, such as the bringing of the "regulation" to the attention of the plaintiff, and the reasonableness of the provision made by it. With regard to these points, the suspicion, we must confess, forces itself irresistibly upon us, that some confusion must have arisen both in the minds of the counsel and of the judge, between the case under discussion and certain cases which have been decided by the courts, from time to time, with reference to conditions printed at the foot or on the back of railway contract-notes and tickets. To us, although we express the opinion with all respect for the view adopted by the learned judge, these cases appear to have little or no bearing upon the present case, and the reasonableness of the regulation and the calling the plaintiff's attention to it to be quite beside the real issue. The real issue, and indeed the only issue properly involved in the case, appears to us to have been whether the "Regulation" printed on the back of the notice signed by the plaintiff, when he deposited his plans, was legally a by-law. In order that such a provision should amount to a by-law, it would be necessary, we apprehend, that the terms of the Public Health Act, 1875, should have been complied with. On referring to the one hundred and fifty-seventh section of that Act, which has been already quoted, it will be found that the provisions which urban sanitary authorities are empowered to make for the observance of the by-laws which the same section authorizes them to make, are to be enacted "therein"; that is to say, they must be enacted in the by-laws themselves. But the "regulation" in question was not contained in any by-law, and was not even referred to by any by-law; it was simply printed at the back of the form of notice of his intention to build, which the plaintiff was called upon to fill up and to sign upon depositing his plans; and although the foot-note on the face of this form called attention to the "regulation" at the back, it surely could not be correctly contended that the "regulation" would be binding upon the plaintiff, however pointedly his attention may have been directed to it, or however reasonable it might appear in its terms to be, if it was beyond the power of the authority to make such a "regulation," or if the statutory requirements respecting it had not been complied with. The one hundred and eighty-fifth section of the Act provides, moreover, that by-laws made by a local authority under the powers conferred by the Act shall not take effect unless and until they have been submitted to and confirmed by the local Government Board, an enactment which had clearly not been complied with as regarded the "regulation" in question, inasmuch as it was not contained in any of the by-laws made by the defendants, and which appears to us to make strongly against the validity of the "regulation," and against its being binding on the plaintiff. Nor can we quit our notice of this case without referring to the high-handed course adopted by the defendants in refusing to afford the plaintiff any information as to the grounds upon which his plans had been disapproved. It is obvious that such a course may involve great hardship and injustice; but we believe it to be also wholly opposed to the spirit and intention, if not to the express letter, of the statute above-mentioned. The one hundred and fifty-eighth section of the Act declares that where a notice, plan, or description of any work is required by any by-law made by an urban sanitary authority to be laid before that authority, the authority shall, within one month after the same has been delivered or sent to their surveyor or clerk, signify in writing their approval or disapproval of the intended work to the person proposing to execute the same. It is, we believe, the law that a mere disapproval is of no avail if the person depositing plans, or the like, can show that no by-law has been disobeyed; but it is obvious that if a bald notice of mere disapproval is to be held a sufficient compliance with the terms of the statute in the section just quoted, no person could have a proper opportunity, either of correcting any defect, omission, or error that might have been made in the plans or other documents deposited, or of showing that no by-law had, in fact, been disobeyed. — *Building News.*

HEIDELBERG CASTLE.



ALL who have heard of the Castle of Heidelberg, or heard of its beauty and deep historic interest, will learn with regret that imminent danger threatens this ruin. In view of the present danger one almost forgets the days of 1622, when the Thirty Years' War broke relentlessly upon this citadel of the Palatinate. The destruction then, as well as that which followed in 1689 and 1693, seem but the precursors of what is now coming. If the destruction at that time had been one of the inevitable attendants upon honorable warfare our regret would be less, but it is impossible, even at this remote day, to pardon the treachery which, by a secret breach of promise, succeeded in blowing up the towers of the building, although, happily, failing in several cases. Moreover, not content with the sacking and systematic firing of the remainder of the palace, there ensued a brutal massacre of the panic-stricken inhabitants, suddenly aroused by the sight of the flames bursting out of the windows of the castle where long had dwelt their princes. It seems almost incredible that to celebrate this cowardly but terrible destruction, the conqueror Louis XIV, should have caused a brilliant Te Deum to be sung, and several coins to be struck, on one of which is to be seen his own portrait, with the legend "*Ludovicus Magnus Rex Christianissimus*," and a representation of Heidelberg burning, accompanied by the exulting phrase, *Heidelberga deleta.* In the following century the adverse elements brought still further destruction to the castle. "On St. John's day, June 24, 1764," reports the journal of an old citizen of Heidelberg, "at 3 o'clock in the morning, the castle was struck by lightning, and so great a conflagration ensued that upon the same day, which was Sunday, the great octagonal tower and the wing toward town, even down to the church were on fire. All the woodwork above the Ritter Saal was soon reduced to ashes; from the flames there was no deliverance. On Monday the castle was still burning, several persons were injured, and the citizens had to be on duty day and night. On Tuesday, the fire somewhat abated, and on Wednesday, the peasants could be sent in to clean out the ruins." After this disastrous storm the hope was given up which had been entertained by Carl Theodor of making the castle once more the seat of Government. Vegetables were planted, and grain was sown in parts of the grounds, many statues were removed from their nooks to the new pleasure gardens laid out at Schwetzingen, while the desolate ruin itself was given up for more than half a century to be a common quarry.

But notwithstanding the most strenuous efforts to prevent it, a destroyer more insiduous than any others has attacked the ruin in late years. On building the railroad which opens up the valley of the Neckar, the projectors of the road estimated that, instead of carrying it along the river bank, it would be cheaper to conduct the track through the mountain on which stands the castle. Hence that disastrous tunnelling was begun, which remonstrances on the part of all Heidelberg could not prevent. The use of powder in excavating this formidable tunnel shook with tremendous force the very rocks on which had rested, hitherto securely, the great building. Had this disturbance occurred, once for all, the danger might have been slight. But it was only the beginning of a succession of earthquakes produced by the ponderous freight trains which now continuously rush through the dark tunnel, making the hoary structure quiver afresh at every ominous warning. How great the damage already done is apparent to every one. In the massive walls of that part of the castle built by Frederick V for his bride, Elizabeth of England, there may now be seen a yawning cavity so closely resembling an arch that a casual glance would lead one to suppose that the architecture here at least is sound. But more careful observation and perchance a falling block from the region of the supposed keystone, will convince one that this gap is but a terrible mockery of the true arch, and tells of the ruthless destruction caused by the railroad. The extent of the mischief done will, however, only be discovered by those privileged to be escorted through the ruins. In the building termed the Enlisch Bau the ruin going on is most apparent. Here, the massive and beautifully-cut stones are slowly but too surely breaking away. Feeble iron clamps inserted, and themselves now yielding, are all that hold these indispensable facings to the coarse inner masonry. After every frost, and even after every gentle snowfall, there drop from the façade of the Otto Heinrich's Bau, those beautifully-carved and deftly-shapen bits of sculpture which clothe this structure with its charms. These fragments strewing the ground each winter and spring have always been carefully collected and preserved. But still more imminent, although less evident to the unpractised eye, is the danger

threatening the old clock-tower. In this apparently so stable building, architects tell us that the great central pillar supporting the whole structure is already tottering, and that we need not be surprised at any moment to see the stately tower come crashing to the ground.

Is this destruction to be allowed its own free play? Are these majestic ruins to be inevitably swept from their sunny heights? are questions which come with great force to every one who has ever heard of Heidelberg Castle. That faithful band, the Schlossverein, led by the architect Seitz, has already succeeded in rousing the tardy Chambers of Baden, and the Grand Duke, who has long seconded the wishes of the citizens of Heidelberg, is now aided by his people. In March, 1883, the Chambers appointed two working bodies, to be subject to the Department of Finance. One of these, termed the Bau-bureau des Heidelberger Schlosses, is the active member of this trio, and in April, 1883, took its seat in the castle itself, occupying those parts which served originally as servants' and housekeeping quarters, and have latterly been rented to English tourists. The task at present set before these workers — composed of two skilled architects, an engineer, a sculptor, and a geologist, with their assistants — is simply to make a thorough diagnosis of the malady from which the old castle is suffering. The remedy must of necessity be a matter of the future. Exact drawings of every part, comprising horizontal as well as perpendicular projections, are being made in the proportion of 1:10. In these the places ruined are marked by blue shading, and the stonecutter's marks, as well as the dimensions of the different blocks, are all noted. Especially important stones or parts of walls are, besides, marked with numbers, and then particularly described, while all architectural or sculptural ornament is represented in its actual size, and accompanied by an accurate account of the nature of the stone, and of its present condition. In addition to such detailed plans general views are also made, and in a separate paper are summed up all the important technical as well as historical points discovered in the course of investigation. The work accomplished by these agencies during one year is astonishing, and but too well confirms the fear of danger. In January last, 66,000 marks were unanimously voted by the Chambers of Baden toward covering the expense of these investigations, any surplus to be applied to the foundations.

The universal interest felt in this rare creation, raises its safety to the high level of an international cause. To a wider public, the Schlossverein (hitherto admitting only residents of Heidelberg) has therefore now thrown open its doors. The castle asks for only one-twelfth of the sum which was raised for the completion of the Cologne Cathedral, and as the necessary funds for that great monument were brought together by thousands of small subscriptions, so the Schlossverein proposes, by greatly increasing its membership, to aid in the salvation of the castle. An annual subscription of 3 marks (75 cents) constitute an ordinary member, and the payment of 50 marks ($12.50) a life member. To all who thus become members of the society it sends an annual report of the transactions, thereby keeping up a lively interest in the work. In Heidelberg, the banking-house of Kistner & Co. offered their services, and in New York, that of Knauth, Nachod & Kuhne. — *Lucy M. Mitchell in the New York Times.*

COMPUTING AN ARCHITECT'S FEE.

WATERTOWN, N. Y, December 23, 1884.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Should the cost of the architects' plans be estimated in making up the cost of a building, upon which he would get a percentage for his plans, when full professional services were rendered? By answering the above, you will oblige J. W. GRIFFIN.

[THE architects' percentage is reckoned on the cost, exclusive of his own fee. — EDS. AMERICAN ARCHITECT.]

PROPOSED BILL DEFINING THE DUTIES OF THE SUPERVISING ARCHITECT.

ST. LOUIS, December 29, 1884.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — The proceedings of Congress have so rarely a distinctly professional interest for architects that the measure lately proposed to place American architects on the same footing in respect to Government buildings which their brethren enjoy in France, will perhaps take them so by surprise that they may fail to give it the attention it deserves. This is substantially the effect of the bill which the Hon. S. M. Stockslager, of Indiana, presented before the House of Representatives, on the 4th inst., and which the *American Architect* has printed in full in its last issue.

The author of this bill has laid it before the architects of the country, doubtless, to invite such comment or suggestion of amendment as may conduce to its successful operation in case it should become a law. The bill seems practical as a whole, and generally well matured. Careful reading suggests, here and there, a change which might perhaps be advantageous.

For example: while the Supervising Architect is a subordinate of the Treasury Department, he is to be appointed, not by the head of that department, but by the President, subject to the consent of the Senate. Again, the Supervising Architect must have a chief assistant, but cannot select him; this must be done by the Secretary of the Treasury. Doubtless, in five cases out of six, these appointments would in fact be made by their respective superiors, the President consulting the Secretary of the Treasury in naming the Supervising Architect, and the Secretary in turn consulting the Architect as to his chief assistant. By a slight change in the bill, this very natural and rather necessary mode of appointment would become the legal one.

Then, since the office of Supervising Architect has no political bearings (or should have none), why require the consent of the Senate to his appointment? Give the Secretary of the Treasury full power to select the Supervising Architect, and make him solely responsible; then let the Supervising Architect alone appoint all his subordinates, and hold him alone responsible. That is, simply invest Government officials with the same powers and responsibilities which obtain in business life, and which are found necessary everywhere.

If the appointment of Supervising Architect could be made for life, dependent only on competency and good behavior, and subject to removal only for sufficient cause, on conviction before a suitable court, it would be likely greatly to elevate the range of ability available for this office. Such an honorable and secure position, even at the moderate salary of five thousand dollars a year, would have its attraction for not a few able and experienced men; but they would most certainly decline to give up their private practice for the rewards of a political office lasting but four years, even at a considerably larger compensation. Need it be remarked that this bill should be so framed as to place at the service of the Government, for its Supervising Architect, the best professional talent and highest personal integrity in the country?

Then is it not very greatly to the interest of the Government that the incumbency of this office should be as permanent as it can possibly be, that it may constantly receive the accumulating benefit which every year of additional experience will give its architect? Men do not hasten to discharge their book-keepers, their foremen, their physicians, as soon as their experience begins to avail them. Why change to a new architect every four years, particularly when the Supervising Architect is no longer to do all the designing of Government work, but is to be chiefly engaged in supervising, as his title imports?

Turning to Section 4, we find that the plans received in competition for public buildings are to be submitted to a Board consisting of the Postmaster-General, Attorney-General, Chief Engineer of the Army, Supervising Architect, and an outside architect selected by the President. The Secretary of the Treasury is not included in this Board, although the buildings proposed are to be erected under his direction, and his experience or that to be found in his department would make his judgment valuable. Undoubtedly there would be frequent need to consult him on occasion of each competition, and were his name to be substituted for that of the Attorney-General, would it not be an improvement?

The *American Architect* has already pointed out the unreasonableness of the sliding scale of compensation proposed in Section 6, which reduces the percentage in proportion as the cost of the building increases. The same section proposes an award of six prizes to unsuccessful designs "amounting in the aggregate to not more than *one per centum* down to *one-half of one per centum*, according to another sliding scale. By this scale the average reward to an unsuccessful competitor for a carefully-prepared design, completely worked out in every detail, so that its author can guarantee the cost to fall within the limit assigned, will be from *one-sixth* to *one-twelfth* of one per centum. Is it not broadly humorous to designate such a reward "*a prize?*" And what class of architects is such liberality in the way of temptations likely to call into activity?

It is not necessary that there should be six prizes beside the first choice. Four would be enough, or even three; but the amount offered for a prize should be sufficient for its purpose, or none should be offered at all. Three to four per centum on the cost of the building, without any sliding scale, would be as little as could answer the purpose of a prize fund for the designs here regarded.

Section 7 provides for advertising a competition for seven weeks beforehand. Were the building in question a grammar-school, or a block of stores, or a dwelling, and were the best architects likely to be much at leisure when the advertisement was made, and chanced to see the first copy, and were the prizes offered large enough to stimulate to enthusiastic effort, seven weeks might perchance be enough for the well-matured designs required. But Government work is apt to be of a complicated and unusual character; the best architects are most apt to be the busiest ones, too busy, often, to see the advertisement till it has run some weeks; the modesty of the prizes has already been noted.

Probably the result would be that the day of decision would be postponed after its first announcement, and even then every one would perceive that much more time should be allowed. This would seem to be a matter which might best be left within the discretion of the Board which directs the competition in other respects. If there be a class of work in this country where every consideration would seem to urge the most ample allowance of time for its maturest development while in the designer's hands, it should be the costly structures which the national Government erects as visible monuments of its greatness and majesty. Six months would be little enough time in a busy season.

Again, this bill requires the Board to abandon the plan selected in

a successful competition if the author shall fail to furnish the working-drawings in full by the time appointed. Now the architect may die, or he may be sick, or for some other reason unable to deliver the working-drawings as required. Yet his design may remain much the best of all submitted, and the Board might be able to procure the working-drawing from some other source, if permitted. This would appear to be preferable to requiring the abandonment of a fine design, simply because its author could not himself supply the working-drawings. Probably the Supervising Architect could in his own department find draughtsmen able to elaborate working details from a selected design of the kind which these competitions are expected to elicit, in case of emergency.

When advertising for bids, it might be well to submit, with the plans and specifications, a blank form of contract, so that bidders would be fully informed as to what will be required of them if successful.

Section 21 provides for the punishment of the Supervising Architect, on conviction of malfeasance in office, by fine, and, at the discretion of the court, by imprisonment for not more than two years. In the latter case it would seem very desirable that the punishment should involve his dismissal from office.

Very respectfully, C. E. Illsley.

SPLINES.

New York, N. Y., December 29, 1884.

To the Editors of the American Architect : —

Dear Sirs, — Will you kindly inform me on the following points. In your issue of October 4, you describe the Lawrence building, as floored with four-inch *splined* spruce; what is the special meaning of the word? In what width was this plank used?

I have seen in your paper, mention of a pamphlet or article by Mr. T. M. Clark, on school-house construction, included, I think, in some Government report. Exactly what report should one apply for, in order to obtain it. Very truly yours,

E. C. Reynolds.

[1. Spruce planks to be splined are grooved on both edges, and a hardwood slip inserted when the planks are put together. This is done instead of tonguing and grooving, to avoid the waste of material involved in forming a tongue on a thick piece. The planks in the Lawrence building run from six to nine inches wide.

2 The pamphlet on school-house construction is known as Circular No. 4, 1880, on "Rural School Architecture," and can be had, if not out of print, by addressing the Bureau of Education, Washington, D. C. — Eds. American Architect.]

MISCELLANEOUS QUESTIONS.

Hartford, Conn., January 3, 1885.

To the Editors of the American Architect : —

Dear Sirs, — What advantages are gained by cambering up the iron tie-rods of long trusses, instead of keeping them horizontal?

2. Does dry quicksand have any deleterious effect on lime, when mixed for building mortar?

3. Which is preferable, river or sea sand, when both are of equal sharpness?

4. What is the best filling for air-tight spaces around an ice-box, charcoal, cement, or air? L. M. N.

[1. No advantage is gained except the extra height under the tie-rod.

2. Quicksand would be just like any other sand for mortar, except that it might be clayey, and would often be too fine for making good mortar.

3. River sand is preferable, because it is free from salt.

4. The best filling is a spongy substance, like hair, felt, or cotton Where this is used, the real non-conductor is the air entangled in the fibres; but as the air is thus prevented from circulating, and carrying heat to the ice by convection from the outside, the fibrous mass is a more efficient non-conductor than the air without it. If a solid substance is desirable, plaster-of-Paris is much the best. — Eds. American Architect.]

NOTES AND CLIPPINGS.

A Long Wire-Rope.—At Cardiff, in Wales, has been manufactured a wire-rope, 2,300 fathoms or 2 miles and 108 yards, long. The weight is 21 1-2 tons. Nearly 100,000 fathoms of wire were consumed in its production. The rope is to be used in working trains in a terminal station at Glasgow.

The Value of Real Estate in Rome.—The advance of real estate in Rome is no less remarkable than its enhancement in other capitals and great cities. The Constanzi Hotel and grounds, purchased a few years ago for $60,000, are to be sold to a body of Jesuits for $150,000. It adjoins the Sallust House, which latter was bought fifteen years ago by a German named Spithover. He gave, in instalments, $3,000 for the property. At the present time it is estimated at $350,000.

Planting Catalpa Trees on the Prairies. — The catalpa trees which were set out by the Evansville & Terre Haute Railroad Company two years ago are now about three inches in diameter, and in three years more will be large enough for cross-ties. Some five years ago a Lawrence (Mass.) gentleman planted a few catalpa seeds, and now has several beautiful trees fully eight feet tall, which this year blossomed for the first time. Catalpas have recently been set out in the Boston Public Garden, and large numbers of them are being raised in Iowa, the idea being to use the wood for fence-rails. These trees grow so rapidly that the matter of raising them from the seed or twig is well worthy the attention of all interested in forestry.

The Public Baths of Vienna. — The public baths of Vienna are said to be the finest in the world. The building is situated in the heart of the city, and encloses a basin 156 feet in width by 578 feet in length, and varying in depth to 12 feet. The enormous quantity of water contained in this basin is renewed three times a day. The whole establishment has accommodation for fifteen hundred persons, and is open from May 1 to October 31, and from five in the morning until dusk. There is also a bath restricted to ladies, open from nine in the morning until one; and the Vienna ladies are especially good swimmers.—*Exchange.*

The Effect of Gas and Electricity on the Purity of the Atmosphere. — At the Theatre Royal, Munich, tests have been made to determine the elevation of temperature and the amount of carbonic acid under illumination of the house by gas and by electricity. The thermometer was observed every ten minutes during the performance, when there was, on an average, an attendance of between five hundred and six hundred persons. The readings of the thermometer indicated a much less increase of temperature for the electric than for gas-light. Further, it was proved that while the electric-light did not render ventilation unnecessary, a less active renewal of the air within the building was required than when gas-light was employed.

South Kensington Museum. — A parliamentary paper has been issued, stating that it is estimated that the various gifts and bequests to the South Kensington Museum would, if sold at the time they were received, have brought about £1,000,000. From 1865 to 1882–3 inclusive, the amount expended in the purchase of objects of art (originals and reproductions) available both for the central museum and for circulation to the provinces, has been £302,148; that for purchases for the National Art Library has been £52,665. The value of the bequests thus far exceeds the sum expended out of the annual votes of the department. Since the museum was opened, in 1857, up to the end of 1883, 22,675,912 persons had visited it. — *Exchange.*

Mechanics' Lien—Lightning-Rods. — The Supreme Court of Iowa has decided, in Harris *vs.* Schultz, that a mechanics' lien may be filed against a building for the lightning-rods put on it. Judge Beck, in the opinion, said: "These rods are not different in character or purpose from metallic gutters, or spouting, or iron anchors. All are designed to secure buildings against the elements and forces of nature. Lightning-rods are for protection against electricity, gutters and spouting for protection against rain, and anchors to give security against wind. It cannot be claimed that gutters and spouting and anchors are not a part of the building; nor can such a claim be set up against lightning-rods. They clearly become essential parts of the building to which they are attached. The labor and materials used in their construction are done and furnished for the building in contemplation of the statue, for which a lien will attach." — *Metal-Worker.*

Public Buildings.—During the last year work has been in progress on forty-two new buildings, under the direction of the Supervising Architect, of which number sixteen have been begun, five completed, and two others practically completed. The expenditures during the year on all new buildings, including sites, have amounted to $2,772,413.58; for repairs and preservation of public buildings, $161,102.32; for heating, hoisting and ventilating apparatus, and repairs to same, $135,000; for vaults, safes and locks, $30,362; and for storage of silver dollars, $85,402.32. The Supervising Architect, in his annual report, refers to three conditions which, under provisions of existing law, operate to the disadvantage of the Government, viz.: 1. The limit of cost of public buildings appears in many cases to have been fixed without sufficient regard to the needs of the public service in cities where the buildings are to be constructed. 2. The appropriations made from time to time within the limits of cost are often inadequate for the proper prosecution of the work after its beginning. 3. Under existing law, no contract can be made binding the Government to an expenditure in excess of an existing appropriation. The remedies suggested by the Supervising Architect commend themselves to my judgment.—*Annual Report of the Secretary of the Treasury.*

The Change in the Structure of Iron.—For fourteen years State Geologist Collett has been experimenting upon a theory that the best of iron, when subjected to continuous strain, would undergo changes in its structure which would, after a time, render its use dangerous, and that these structural changes were the explanation of many otherwise inexplicable accidents, particularly to railway bridges. He has lately undertaken a systematic investigation, which has resulted in a confirmation of his theory. For experiment he took from the Wabash dam, at Delphi, a number of bolts and spikes, which were, when the dam was constructed, of the best quality of malleable bar-iron, as is shown by the battering of the head when they were put into the structure. Of these bolts and spikes, he found that seventy per cent of the whole number were as weak as cast-iron, while ninety per cent of those which were near the bottom of the dam were worthless; yet of those which were rotten, the tips where inserted in immovable rocks were fibrous and strong. When broken they showed polished ends to the connecting fibres, indicating that the continued vibrations of many years had polished and rounded the points of fibrous structure. A similar effect is found in "the partings" or "horsebacks" in coal-mines, which become polished and striated by the continuous quiver and motion of the crust of the earth. Dr. Collett says that all car-axles, after a reasonable run, become crystallized two-thirds of the length from the hub and one-third from the outside extremity, rendering them worthless. On one Indiana railroad bridge he found that the bottom parts of the vertical strain-pieces were crystallized for from two to four feet in length, and, as a precaution against what would inevitably have caused a great catastrophe, they were replaced. The matter is one of great interest to railways, and the specimens which Dr. Collett has collected in his experiments are to be sent to the Stevens Institute of Technology, where an investigation of the subject has been in progress for several years, by a scientist connected with the Institute.—*Exchange.*

GELATINE EDITION.

During the year 1885 a series of Gelatine Prints, (Heliotypes) photographed from the natural object, will be published in the AMERICAN ARCHITECT AND BUILDING NEWS.

These gelatine prints will be issued once a month to those subscribers only who will pay a dollar extra for the twelve prints.

SUBSCRIPTION PRICES.

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IMPORTANT NOTICES.

IT will greatly simplify our book-keeping and prevent future complaint, if those of our present subscribers who (having already paid to various dates of 1885) wish to receive the gelatine plates will make their remittances cover the *entire* year to January 1, 1886, by remitting at the rate of fifty cents for each remaining month, in addition to the dollar for the gelatine prints.

Example: X. whose subscription naturally would end October 1, 1885, should, if he desires the gelatine edition, remit $2.50 additional — that is, $1.00 for the gelatine prints and fifty cents for each of the remaining months of the year.

ADVERTISERS, whose contracts run through the entire year, receiving the *American Architect* free can secure the gelatine plates by remitting $1.00 for the entire year.

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents herementioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

309,603. STONE-DRESSING MACHINE.— Thomas H. Cook, Owego, N. Y.

309,612. CEMENT COMPOSITION FOR MOULDING BRICK, ETC. — Richard B. Eason and John J. McGilvey, New York, N. Y.

309,619. FIRE-ESCAPE. — Tobias Hamilton, Centrefield, O.

309,625. STEAM-HEATING APPARATUS. — Peter H. Inman, Highland Park, Ill.

309,631. KNOB ATTACHMENT. — Charles F. Langford, Brooklyn, N. Y.

309,633. DOOR.—Frederick J. Lee, Oswego, Kans.

309,636. WINDOW. — Eugene D. Mann, New York, N. Y.

309,646. SAW.—Jasper L. Purple, Owego, N. Y.

309,696. DEVICE FOR CLEANING STREET SEWER-PIPES.—Thomas Dark, Buffalo, N. Y.

309,728. REGULATOR OF TEMPERATURE OF APARTMENTS.—Joseph Morwitz, Philadelphia, Pa.

309,755. DIE-STOCK.—Bruno Wesselman, Hamburg, Germany.

309,757. ELEVATOR.—James Berry, Buffalo, N.Y.

309,763. SAW-FILING MACHINE.—David Chambers, Hull, Quebec.

309,771. EVAPORATOR FOR HOT-AIR REGISTERS.—Charles T. Davis, Baltimore, Md.

309,799. BLOWER AND HEAT-REGULATOR. — Niels Poulson, Brooklyn, N. Y.

309,811. RADIATOR. — Thos. H. Williams and Samuel D. Tompkins, Jersey City, N. J., and John N. Matlock, Brooklyn, N. J.

309,813. SHUTTER-FASTENER. — William H. Bothwell, Philadelphia, Pa.

309,819. WASH-BASIN AND BATH-TUB. — Charles Colahan, Cleveland, O.

309,822. COMBINED LOCK AND LATCH. –Ransom D. Crane, Winchendon, Mass.

309,827. SLIDING DOOR. — Edward Drake, Prattsburg, N. Y.

309,836. TILE-KILN.— Lindsey C. Farnam, Niantic, Ill.

309,846. PAINT. — Jonathan H. Greene, Philadelphia, Pa.

309,856. HANGER FOR A PAIR OF DOORS. — Elmer N. Hutchins, Lawrence, Mass.

309,857. WINDOW-SHADE.— Walter F. Morgan and George Kauffmann, Leavenworth, Kans.

309,868. AUGER.— Holcomb Olson, Olesburg, Kans.

309,887. RATCHET-BRACE.—Amos Shepard, Plantsville, Conn.

309,902. BIT-STOCK.— John Watson, Buffalo, N. Y.

309,929. FIRE-ESCAPE.— John E. Clokey, Washington, D. C.

309,932. DOOR-CHECK. — Martin H. Crane, Cincinnati, O.

309,940. FIRE-PROOF COMPOUND AND SHEETS MADE THEREOF.—Nathaniel C. Fowler, Boston, Mass.

309,943. HEAT-INSULATING COMPOUND. — Carl Grünzweig and Paul Hartman, Ludwigshafen, Ger.

309,963. LOCK. — Ernest Korbel and Louis Kurz, New York, N. Y.

309,973. FILE. — Ludwig Müller, Dresden, Saxony, Germany.

309,975. CEMENT-PIPE CONNECTION.—John V. Niolai, Cincinnati, O.

309,986. TILE-KILN. — John W. Smith, Kilmore, Ind.

309,988. FASTENING FOR MEETING-RAILS OF SASHES.—Thos. S. Smith, New Haven, Conn.

309,989. RATCHET-DRILL. — Thomas P. Somes, Revere, Mass.

309,993-994. SELF-CLOSING HATCHWAY. — Richard D. Thackston, St. Louis, Mo.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report but two permits have been granted, which are as follows: —

Henry Brinkmeyer, three-st'y brick building, e s Eden St., bet. Baltimore and Hampstead Sts.

J. H. Frisby, 4 three-st'y brick buildings (square), com. n w cor. Townsend St. and Morton Alley.

The whole number of permits granted in the year 1884, was 3,208.

Boston.

SCHOOL-HOUSES. — Following are the new school-buildings in process of construction, with the amount of appropriation for each, all of which are in various stages of progress: —

Grammar school-house, Bennett district; cost, $23,000.

Grammar school-house, Huntington Ave.; cost, $101,000.

Grammar school-house, Hammond St.; cost, $85,000.

Grammar school-house, Minot district; cost, $40,000.

Primary school-house, Blossom St.; cost, $76,769.35.

Primary school-house, Brighton district; cost, $7,600.

Primary school-house, Harrison Ave.; cost, $50,000.

Primary school-house, Parker St.; cost, $35,000.

Primary school-house, Prescott St.; cost, $8,000.

The above-mentioned buildings are well advanced toward completion.

Brooklyn.

BUILDING PERMITS. — *Dikeman St.*, s s, 275' e Van Brunt St., three-st'y frame (brick-filled) double tenement-house, tin roof; cost, $3,300; owner, Rosa McLaughlin, 73 Dikeman St.; architect, F. D. Van Pelt.

Reid Ave., n e cor. Hancock St., three-st'y brownstone store and tenement, tin roof; cost, $12,000; owner, Chas. H. Althaus, 178 Second Ave., New York; architect, Carl F. Eisebach; builder, not selected.

Wyckoff St., n s, 50' w Nevins St., four-st'y brick tenement, tin roof; cost, $8,000; owner, Mrs. B. McGuire, on premises; architect, R. Dixon; builder, Owen Nolan.

York St., s w cor. Hudson Ave., two-st'y brick store and dwell., tin roof; cost, $4,900; owner, Mrs. Mary T. Donohue, 186 Herkimer St.; builders, Edward T. Rutan and James Sheriden.

Steuben St., e s, 400' n Park Ave., three-st'y brick tenement, tin roof; cost, $6,000; owner, Mrs. Coyle, 25 Schenck St.; architect, E. F. Gaylor; mason, Jas. Rooney.

North Elliott Pl., e s, 279' s Park Ave., 11 three-st'y brick tenements, tin roofs; cost, each, $6,200; owner, Bryant McAleveney, 992 Bergen St.; architect, F. D. Van Pelt.

Hudson Ave., w s, 50' 8" s Concord St., four-st'y frame (brick-filled) tenement, tin roof; cost, abt. $6,000; owner, Jas. L. Dougherty, 625 Fulton St.; architect, Chas. E. Hebbard.

Woodbine St., s e, 275' e Broadway, two-st'y frame (brick-filled) dwell., tin roof; cost, $3,000; owner, J. Esquirol, Woodbine St.; architect, Th. Engelhardt.

Marcy Ave., e s, 20' s Rutledge St., 3 four-st'y brick tenements, tin roofs, iron cornices; cost, each, $8,500; owner and builder, Henry Grasman, 142 Marcy Ave.; architect, Frank Holmberg.

Forest St., s w cor. Evergreen Ave., five-st'y brick brewery, slate and tin roof; cost, $14,000; owner, S. Liebmann's Sons, Forest St., cor. Bremen St.; architect; Th. Engelhardt; builder, U. Maurer.

Melrose St., *No.* 24, s s, 250' e Evergreen Ave., three-st'y frame tenement, tin roof; cost, $3,600; owner and builder, Chas. Gossman, 36 Ellery St.; architect, E. Schrempf.

Conselyea St., *No.* 179, n s, 200' e Graham Ave., three-st'y tenement, tin roof; cost, $6,800; owner, D. Weber, 156 Grand St.; architect, A. Herbert.

Broadway, n e, 60' w Van Buren St., three-st'y frame store and dwell., tin roof; cost, $3,500; owner, A. C. Beardsley, No. 1159 Broadway; architect, F. Halmberg; builder, not selected.

Moore St., *Nos.* 53 *and* 55, n s, 125' e Ewen St., four-st'y frame warehouse, tin roof; cost, $3,500; owner, Charles Goetz, 57 Moore St.; architect, F. Halmberg; builders, H. Bruchhauser and J. Rueger.

ALTERATIONS. — *North Eleventh St.*, n w cor. Third St., repairs, new chimney, etc.; cost, $5,000; owner, D. C. Robbins, 29 Monroe Pl.; architect, W. Dobson; builders, Burns & McCann and C. Dankhasse.

Fort Greene Pl., *No.* 201, two-st'y brick extension, gravel roof; cost, $3,000; owner, J. G. Burckle, 469 West Thirty-fourth St., New York; architect, C. Werner.

First St., *Nos.* 180 *and* 182, No. 180, new front only; No. 182, add two stories, tin roof, iron cornice, also one-st'y brick extension, new front; cost, $5,000; owner, George Young, 180 First St.; architect, E. F. Gaylor; builders, Jos. Rodwell and Samuel Hough.

Court St., n e cor. Butler St., new store front, also interior alterations; cost, $3,500; owner, M. Toomey, Twenty-eighth St., New York; architects and builders, M. Freeman's Sons.

Chicago.

BUILDING PERMITS. — A. Hierman, three-st'y flats, 245 Noble St.; cost, $4,000.

Imperial Building Co., four-st'y store and office-buildings, 258 South Clark St.; cost, $100,000; architect, L. G. Halberg; builder, John Griffiths.

P. Hayes, two-st'y dwell., 713 North Clark St.; cost, $3,000; builder, P. Hayes.

Mrs. C. Thomas, three-st'y flats, 12 Page St.; cost, $10,000; architect, Wilson & Moodry; builder, W. H. Thomas.

Mary E. Sands, 6 two-st'y dwells., 862-872 West Adams St.; cost, $12,000.

Mrs. A. M. Parker, two-st'y dwell., 3667 Michigan Ave.; cost, $9,000; architect, S. J. Pierce; builder, W. H. Sliff.

New York.

THE business in building interests at the present moment is at a standstill, and architects are only making preliminary plans.

BUILDING PERMITS. — *Stanton St.*, *No.* 229, five-st'y brick tenement and store, tin roof; cost, $15,000; owner, Adam Wetzler, 229 Stanton St.; architect, Wm. Graul.

Eighty-eighth St., s s, 76' w Avenue A, 3 five-st'y brick tenements, tin roofs; cost, each, $13,000; owner, Wm. H. Johnston, 51 East Ninety-first St.; architects, A. B. Ogden & Son.

Fiftieth St., s s, 200' w Ninth Ave., five-st'y brick tenement, tin roof; cost, $21,000; owner, Deborah W. Slocum, 72 Rodney St., Brooklyn; architect, R. Rosenstock.

Third Ave., n e cor. Forty-first St., five-st'y brick tenement and store, tin roof; cost, $20,000; owner and architect, Jos. Spears, 2281 Third Ave.; builders, J. & W. O. Spears.

Second Ave., w s, 75' s One Hundred and Fifteenth St., five-st'y brick store and dwell., tin roof; cost, $22,000; owner, architect and builder, same as last.

First Ave., e s, 50' 5" n Forty-eighth St., 4 five-st'y brick stores and tenements, tin roofs; cost, $16,000; owner, Mrs. Ann Mulholland, 1324 Lexington Ave.; architect, J. C. Burne.

Fifty-sixth St., s s, 100' e Ninth Ave., 4 five-st'y brown-stone apartment-houses, tin roofs; cost, $30,000; owner, Charles Riley; architect, J. C. Burne.

One Hundred and Thirty-seventh St., *No.* 610, four-st'y brick tenement, tin roof; cost, $16,000; owner, Mrs. Mary Woods, 533 East One Hundred and Fifty-third St.; architect, J. C. Burne.

Eighty-first St., s s, 73' e Ave. A, five-st'y brick tenement, tin roof; cost, $10,500; owner, C. Haenschen, Jr., 114 East One Hundred and Fifteenth St.; architect, John Brandt.

Ave. C, *Nos.* 43, 45 *and* 47, one-st'y brick church, slate roof; cost, $30,000; owner, St. John the Baptist Foundation, Francis H. Weeks, Treasurer, 11 East Twenty-fourth St.; architect, Henry Vaughan; builders, D. C. Weeks & Son.

Seventy-sixth St., n s, 325' w Ninth Ave., 12 four-st'y brown-stone front dwells., tin roofs; cost, total, $210,000; owner, John S. Kelso, Jr., 30 East Twenty-second St.; architect, Wm. A. Cable; builder, Geo. E. Broas.

Railroad Ave., e s, 190' 4" n One Hundred and Sixty-ninth St., two-st'y frame dwell., tin roof; cost, $4,500; owner, George Hey, 331 Broome St.; architect, Julius Boekell.

Ryer Ave., e s, 225' n One Hundred and Eighty-second St., two-st'y frame dwell.: gravel roof; cost, $2,500; owner, Drusilla Lynch, 312 West One Hundred and Thirty-fifth St.; architect and builder, E. C. Lynch.

One Hundred and Fifty-seventh St., n s, 200' n Tenth Ave., three-st'y frame dwell., tin roof, cost, $4,000; owner and builder, C. R. Terwilliger, One Hundred and Fifty-sixth St., near Tenth Ave.; architect, H. Kreitler.

West Tenth St., *Nos.* 270, 272 *and* 244, four-st'y and attic brick school-house, tin roof; cost, $70,000; owner, City of New York, Stephen A. Walker, President Board of Education, 8 East Thirtieth St.; architect, D. I. Stagg.

Jay St., s e cor. Caroline St., 2 six-st'y brick stores and lofts, metal roofs; cost, each, $21,000; owner, Patrick Skelly, 137 West Fifteenth St.; architect, John B. Snook; builder, John Fish.

One Hundred and Sixty-fifth St., n s, 25' e Tiffany St., one-st'y frame dwell., shingle roof; cost, $2,500; owner, Ada A. Morgan, 419 East Seventy-eighth St., architect, J. N. Gillespie.

Ninety-first St., n s, 94' e First Ave., four-st'y brick factory, gravel roof; cost, $15,000; owner, John J. Schillinger, 420 East Ninety-second St.; architects, A. B. Ogden & Son.

Macdougal St., *No.* 52, five-st'y brick tenement, tin roof; owner, John P. Schweikert, 409 West Fifty-first St.

Philadelphia.

BUILDING PERMITS. — *Ashmead St.*, between Main and Wakefield Sts., 2 two-st'y dwells., 16' x 40'; also, three-st'y dwell., 15' x 26', *Main St.*, cor. Cumberland St.; Jno. D. Caldwell, contractor.

Twenty-fifth St., above Masted St., three-st'y store and dwell., 16' x 45'; Jno. G. Ruff, contractor.

Eleventh St., n w cor. Chestnut St., extensive front and interior alterations; Allen B. Rorke, contractor.

BUILDING operations in Philadelphia during the past year showed great activity. The total number of new structures erected was 4,298, against 3727 in 1883, and 2220 in 1882.

St. Louis.

BUILDING PERMITS. — Fifteen permits have been issued since our last report, eight of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

A. R. Ennis, two-st'y brick dwell.; cost, $4,900; Ennis & Swope, contractors.

C. Balfer, two-st'y brick dwell.; cost, $2,500; A. Wagener, contractor.

Wm. Murphy, two-st'y brick dwell.; cost, $3,000; Wm. Murphy, contractor.

William Stutz, 4 adjacent two-st'y dwells.; cost, $8,000; Hermann & Schumacher, contractors.

M. S. Gray, two-st'y brick dwell.; cost, $8,500; Jno. Mahon, contractor.

C. Hackemeier, two-st'y brick dwell.; cost, $8,000; Aug. Beinke & Co., architects and contractors.

A. Fenner, 2 adjacent two-st'y brick dwells.; cost, $3,000; Koenig, architect; A. Fenner, contractor.

St. Paul, Minn.

BUILDING PERMITS. — W. H. H. Johnston, two-st'y frame double dwell., 40' x 40', w s of Floral St., between Summit and Grand Sts.; cost, $5,000.

William Byrne, two-st'y frame dwelling-house, n s of Martin St., between Mackubin and Arundel Sts.; cost, $4,000.

General Notes.

ALLENTOWN, PA. —Koch & Shankweiler are to build a new hotel in place of the Allen House.

ANSONIA, CONN. — House and barn for W. Rowe; cost, $5,000; Palliser, Palliser & Co., architects, Bridgeport, Conn.

BEDFORD, MASS. — A Catholic church is to be built here.

BRATTLEBORO', VT.—H. G. Carroll is about remodeling his summer house, at an expense of $7,000, from plans by J. M. Currier, Springfield, Mass.

BRIDGEPORT, CONN. — Francis Duffy is building a frame block for stores, cor. Broad and Whiting Sts., 78' x 110', three-st'y; cost, $7,500.

John Rockfeller is building an addition to Elm Hotel, three-st'y, brick; dining-room, 25' x 50'.

Geo. Hubbel is building two frame houses; cost, $4,500.

A. Carmody, frame house, cor. Columbia and Gregory Sts.; cost, $3,000. W. H. Worsam, architect for the above.

J. A. Herley, two houses on Prospect St.; cost, $9,000.

D. T. Crockett, house; cost, $8,000; Palliser, Palliser & Co., architects.

T. Glasson, block of stores and tenements, Pembroke St.; cost, $7,000.

J. Burns is building a house; cost, $3,000.

D. Nolan, house on California St.; cost, $3,000.

J. J. Phelan is having a house built on Burroughs St.; cost, $4,000.

R. H. Townsend, cottage; cost, $4,500.

P. W. Wren, brick house, State St.; cost, $22,000. Palliser, Palliser & Co., architects of above.

BROCKTON, MASS. — City of Brockton Fire Department Building, three-st'y, brick and granite, with stable, hose, and bell-tower; cost, $20,000; Eldred & Holmes, contractors.





PAXON & COMFORT'S BUILDING, PHILADELPHIA, PA.
W. EYRE, JR. & W. E. JACKSON ARCHITECTS.

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CONTENTS.

THE New York *Commercial Advertiser* asserts that notwithstanding the almost unprecedented activity of building during the past year, thousands of men belonging to the different building trades are now out of employment in that city. There is, among real-estate owners there, a general feeling that carpenters' and masons' wages are too high, as compared with salaries in other employments, and with the cost of living, and in anticipation of the fall which is regarded as sure to come, hundreds of projects for building have been postponed. The winter is usually a dull season, but the temporary postponement of so many improvements has brought about a stagnation almost complete. The little work that still goes on is done by men from other places, particularly from Canada and New England, who are cut off by their more severe climate from work at home during the winter, and are glad to earn wages considerably lower than those fixed by the New York Unions. The *Commercial Advertiser* thinks that the Unions should recognize the difference in the demand for labor between winter and summer, and should provide a lower scale of wages, which could be accepted by their members at the season when cold weather and short days make their labor at once less needed and less valuable, without incurring the penalties attached to the violation of the Union codes; and although we are very far from wishing to see the incomes of the most useful members of the community diminished, it is plain that high wages during eight months in the year, and enforced idleness for the rest of the time, amount to less in the end than regular wages through the whole year, graduated according to the demand. Many stone-masons and bricklayers, who dare not, for fear of the Unions, work for less than the schedule rates, and who cannot find employment in winter at those rates, leave the country altogether, and pass the dull season in England or Scotland, and this winter the number of mechanics crossing the ocean eastward is said to have been exceptionally large. The cost of a voyage in the steerage to Liverpool or Southampton is hardly more than that of living in New York for the same length of time, and, once landed, the skilled workman is pretty sure of employment, at rates about which he is free to exercise his own discretion; while an opportunity is afforded him, when spring opens, and work at high wages waits for him in New York, of making money enough to pay his passage both ways by purchasing in England a liberal outfit of clothes and tools, and selling them in New York, after passing them free of duty through the Custom-house, at a handsome profit.

SOME slight movements have taken place in the City Building at Philadelphia, due to the gradual imposition of the great weight of the tower upon the masonry below, which, although not serious, are of interest to architects and builders who have to deal with large buildings. The tower, as our readers will remember, is to be the highest structure in the world, next to the Washington Monument, and being of very solid construction its weight is enormous. The piers and foundation on which it rests have been carefully calculated, according to the testimony of Mr. McArthur, the architect, so that the strain upon them nowhere exceeds nine tons to the square foot, but even with this prudent limit of compression there has been a settlement of the more heavily loaded portions, which has cracked and broken some of the beautiful polished and sculptured stone in the interior. Mr. McArthur attributes this effect, no doubt correctly, to the filling of the horizontal joints above and below the polished and carved stones out to the face of the stone. The brick backing settling most, the pressure of the walls is concentrated on the facing-stones, and the mortar between their exterior edges, hardening first, serves to intensify the strain upon the angles, which have "flushed," or split off. If the foremen of the masons had seen that their men laid these joints "slack," so as to relieve the pressure at the extreme edges, the work would probably have remained intact. On the outside, in the same way, several long stones, forming the architrave of a massive string-course over a row of arched windows, have broken in two, just over the keystones of the arches, by reason, evidently, of the settlement of the piers between the windows, in which one end of each architrave block was engaged, while the middle was held up by the less weighted key-stone. This is an effect so common in such situations that one would think that masons might learn to leave the mortar out of the bed of such stones until the structure had settled, or else to make a joint over the key-stones of the arcade; but heavy building is not yet common enough in this country to enable architects to rely upon the knowledge of contractors or their men.

THE city of Toronto advertises a competition for designs for a new court-house, under terms which in some respects merit special commendation. Although far too short a time is given for preparing the designs, it is agreed that the drawings, with the description and estimate accompanying each, shall be submitted to a jury of three experts, to be named by the committee having the construction of the building in charge; and the report of a majority of the members of this jury is to be accepted by the committee as final, and will be "by it strictly adhered to." It is furthermore agreed without reserve that the author of the design selected as the best shall be entrusted with the carrying out of his design at a commission, not of five, but of four per cent, on the contract price. This curious docking of one-fifth of the architect's pay is probably the work of one of the cheap economists who infest city councils; and as the town is likely on account of it to forfeit all hope of interesting architects of ability and respectable character in its competition, we hope for its own sake that it will see fit, while there is yet time, to bring this item of the invitation into conformity with the intelligent and honorable spirit of the rest, and restore the rate of compensation promised to that recognized all over the civilized world as only fairly remunerative.

WE are glad to see that a peculiarly mean corporation has unexpectedly met its deserts in England, while trying to deprive an architect of his pay by means of what was intended to be simply a shameless swindle. The corporation in question, which deserves to have its name held up to scorn, was the School Board of the Great and Little Clifton District. This Board employed an architect to make drawings for a school building, and to superintend their execution. He performed his duties, so far as appeared, to the satisfaction of the Board, and then applied for his pay; but it was refused, and on bringing the case into court he was met with the cool response that his appointment, which was made by a vote of the Board, recorded on the minutes, and signed by the Chairman and the Clerk of the Board, was not sealed, and was therefore not valid; under the statute which provides that contracts of corporations, relating to matters involving an expenditure of more than fifty pounds, shall not be valid unless sealed with the corporation seal. One or two cases of the kind have already been decided in favor of the corporations claiming this protection, but in the present case the corporation, being a School Board, was subject to special regulations, provided by the law, and explaining or modifying the application of the general statute. Fortunately for the poor architect, one of these special regulations, which the crafty School Board had overlooked, expressly provides that the appointment of any officer of such a Board may

be made in the way in which the architect was appointed, and that an appointment so made shall be as valid as if made under seal. The architect, in the opinion of the judge, was an officer of the Board, and his appointment was therefore valid, and he was entitled to judgment in his favor.

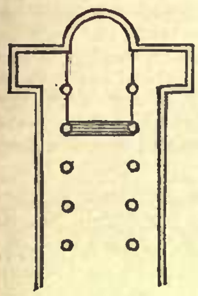
THIS is only one among the numerous cases which come to our notice where architects, particularly the younger ones, are, to speak plainly, cheated out of their hard-earned pay on pretexts of the most flimsy and absurd character by persons who know the cost and annoyance in which a suit involves a professional man, and believe, with reason, that the poorer man will swallow his disappointment, and try to make up his loss by extra labor, rather than appeal to the law for redress. As a protection against the devices of these churls, we believe that such an association as the French Caisse de Défense Mutuelle offers a very great advantage. One of the first duties, for instance, to which the officers of this society have applied themselves is the collection, under the guidance of two eminent lawyers, of records of all adjudicated cases relating to matters of building or professional service. This collection is to be indexed, and reports of new cases added as soon as they appear, so that the member who feels himself in doubt as to his rights has only to consult the officers of his society to be informed, both as to the propriety of his claims, and the best method of enforcing them; and if he is compelled to attempt the latter, the society will undertake the case for him, paying all the court costs and counsel fees, and carry it through to a verdict, handing over to him the amount collected, less a certain small reserve to be added to its own funds. The improvement which such an association is capable of making in the business prospects of architects, particularly the younger ones, can hardly be realized, except by those who have the trials and disappointments of their early practice fresh in their memory. Apart from the management of suits, which need not be frequent, the fact that every young architect of good professional standing was backed by an association with ample funds, ready at a word to undertake the enforcement of his rights without any sentimentality or bashfulness, would secure for all the respectable members of the profession a considerate treatment, and an appreciation of the fact that their services must be paid for, which even the best of them do not now find universal. The bright example of the abler men has brought about a great change in public opinion within a few years, but there are still, thanks to the abuse of the competition system, plenty of people who pretend to believe that architects expect to work for nothing, and to put up with barefaced robbery from those who are rich enough to frighten them by threatening them with lawsuits. The time has quite come for administrating a few wholesome lessons to these gentry, and thereby completing the change in the popular idea of the rights of architects, and in no way that we can see can it be done so well as by a Defensive Association such as we suggest. With the example before us of the French society, managed by the most distinguished architects and lawyers in France, we could hardly go far astray, and the two societies could render each other invaluable assistance.

THE preparations for the Paris Exposition of 1889 have advanced as far as the selection of a site for the buildings, the Champ-de-Mars, the place of the last exhibition, having been chosen unanimously by the Commission. For competitive trials, and other matters where much space is required, a sufficiently large territory will be reserved at Vincennes. Although Vincennes is at the other side of the city, there is no real objection to separating the experimental part of the exhibition by a considerable distance from the mere show. In fact, each department might be in a separate quarter of the city with positive advantage to those who go to the exhibition to learn, rather than to stare at a huge jumble of things which do not interest them in the least. The choice of the comparatively small Champ-de-Mars will save a considerable expense in construction, the Trocadéro Palace, which formed one of the principal buildings of the exhibition of 1878, being close by, while the ground has already been graded and prepared for the purpose. For foreigners, who do not care how much money is spent in amusing them, this is an unimportant matter, but they have a reason of their own for being glad that the old exhibition ground is to be used again, as it is far more easily and pleasantly accessible than any suburban village could be, and is surrounded by beautiful and interesting objects. To our mind, recalling the dreadful weariness of the journey among the Fairmount Park buildings, it seems extremely important to plan the group of exhibition halls as compactly as possible. Notwithstanding the conveniences of electric railways and other means of transportation, one has in hot weather a certain repugnance to crowded cars, even for a brief journey, and we imagine that it might be quite possible to plan buildings in direct communication with each other, where every kind of natural and artificial product could be shown in perfection. We could also, for our part, dispense with the houses and side-shows which took up so much room at Philadelphia and Paris. There is obviously no necessity for lodging the foreign commissioners on the grounds, and national taste in architecture could just as well be shown in the decoration of rooms in the main buildings, which could serve as restaurants or exhibition rooms, as in separate structures. In fact, there is nothing which we should like better to see than a series of rooms, not built for the purpose of advertising somebody's concrete blocks, but decorated by the best artists and architects in each country in emulation of each other. We have a fancy that our own country would come out of such a struggle with no small credit, and the idea has never been carried out on a large scale in any exhibition.

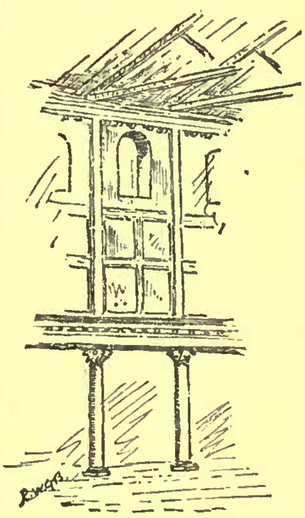
AN important scheme is said to have been entered into by some of the railway companies in New York, for cutting a tunnel under the East River, from Ravenswood, on Long Island, to Blackwell's Island, and thence to the New York shore. This tunnel is to be built for the benefit of the Long Island Railroad, which will by means of it gain an entrance into the city, and an agreement has been made with the owners of the Grand Central Station for admitting the Long Island Railroad to the use of that station as soon as the tunnel is completed. The bed of the East River is of hard rock, and the tunnel, although not a long one, will be very costly, so that if the project is seriously entertained it is perhaps only a part of some plan for raising the Long Island Railroad from a local line of very limited traffic to the position of a link in a chain of communication between New York and Europe. It is quite likely that the next ten years may see some improvement made in the present circuitous route from New York to Liverpool by way of Sandy Hook, and whether the future steamship route lies through Long Island Sound to Harlem, or ends at Montauk Point, passengers, at least, are likely to choose railway transportation from the eastern end of Long Island to New York.

PROFESSOR BELL is said, in a paragraph which is going the round of the newspapers, to have recently expressed the opinion that the telephone has not reached the utmost limit of development, and to have suggested the possibility that some improvement might yet be made in the service afforded those who use it. We are sorry to say that the history of the telephone business does not give very flattering hopes of the latter contingency, but that the telephone is capable of development no one will doubt. To mention one point only, the sound delivered by the telephone receiver is estimated to be of about one twelve-hundredth of the force of that communicated to the transmitter; and as it is our fortune to speak through the telephone to a good many persons whose natural voice has a force amounting to not much more than twelve hundred times a dead silence, we should hail with joy the adoption by the telephone companies of any device for magnifying the sounds transmitted through their instruments. Together with this should come facilities for communication through long distances. Nearly four years ago we were told by officers of the telephone company that they "talked between Boston and New York every night;" and that the opening of public communication between those two cities was a question of a few weeks only; but although the same hopeful spirit pervades the announcements of the company, the advancing years do not seem to bring long-distance talking within the reach of its subscribers. From other quarters we hear reports of communication, by means of other telephones, which is wonderful as compared with the operation of the instruments with which we are familiar. With one, for instance, conversation has, it is said, been easily carried on between New York and Chicago, a distance of nine hundred miles, and, more recently, communication is said to have been held between Boulogne, in France, and St. Petersburg, a distance of more than sixteen hundred miles.

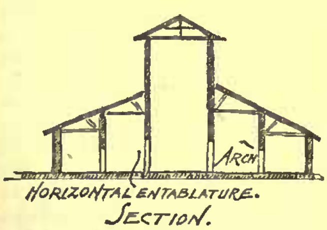
A SKETCH OF THE HISTORY OF ARCHITECTURE.[1] — II.



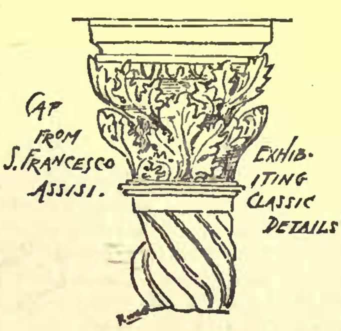
IN point of time we have now reached the middle of the fourth century, A. D. During these 350 years, the Christian religion was slowly and surely gaining ground, and the old worship of imaginary deities dying out. When, in the time of Constantine, the persecuted and scattered church, finding favor with the Emperor, emerged from the catacombs, no buildings were so suited for their services of worship as the basilicas, and no others were large enough to hold the masses of people, who, attracted by the bold preaching and curious rites of the new religion and its followers, thronged together to see and hear for themselves. The bishops and priests naturally took the seats provided for the magistrates, and the altar, still in its original place, served for the performance of Christian rites as it had done for heathen. At the end of the fourth century changes were introduced. The apse was first railed in, and then the altar, and the dais on which it stood, and which projected beyond the precincts of the apse. Finally the choir was formed, extending into the nave, and raised two or three feet above the floor of the rest of the building. The first Church of St. Peter, at Rome, erected at this time was a good example of the peculiarities of these reformed basilican buildings. The plan of the church proper is rectangular, having at one end a sanctuary, corresponding to the Gothic chancel, extending beyond the north and south walls of the nave.



The nave was divided into five aisles, by rows of pillars supporting a horizontal entablature, above which rose a double range of panels, each containing a picture, and corresponding with the triforium of later date. Above these again was a clerestory, and then an ornamental belt or cornice, and above that the wooden roof left open to the ridge. The columns in the *side* aisles were joined by arches.



Externally the basilicas were very simple in design. The walls were of plain, unplastered bricks, and the windows had plain, arched heads, without any attempt at decoration. The front façade was slightly ornamented with two rows of windows, three in each tier, and between and above these were painted in fresco on stucco, various emblematic figures. The whole was surmounted by a coved cornice, which appears to have been almost universally applied. In the Church of San Lorenzo, erected about 540, a triforium gallery was constructed, but this did not find favor with the architects generally, as it never was used in other churches. The church of Ravenna, San Apollinare in classe, shows a great advance in the style, although it is still easy to trace the derivation of every detail from the Classic model. Another specimen of the transition is at Parenzo, in Istria; it possesses all the usual arrangements of a church of this date; but some of its pillars are of the Corinthian order, while others are of pure Byzantine type. The Romanesque architects never attempted to vault their rectangular buildings, but frequently constructed domes over their circular ones. But here again the Italians differed from their forefathers of Constantine's day, for the interior of their domes was not the outline of their buildings. The dome was by them simply used as a ceiling, and was covered with an external wooden roof. True Romanesque had nearly come to an end with the sixth century, from which period to the commencement of the ninth century, a time of continual wars, there was little opportunity to cultivate the arts of peace. The next two centuries, from the ninth to the eleventh, saw but tentative efforts in the advance of art, but in the eleventh century we find that Gothic art has freed itself from the early traditions, cast-off Classic details, and is going steadily forward with a well-defined object in view.

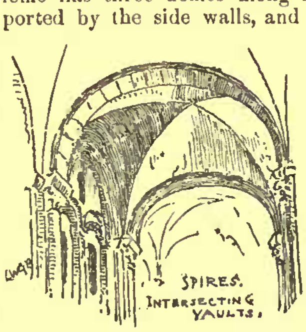


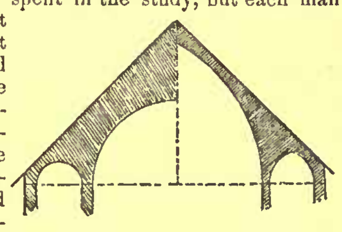


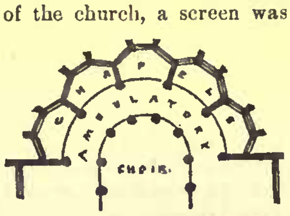


We must take up our study in the south of France, and commencing with the Province of Provence at the early part of the ninth century, the first new feature that attracts our attention is the stone vaulting of the churches. The plan is still the same, though slightly elongated, and not so wide as the basilicas of Rome. All the churches of this province from the date of Charlemagne can boast of vaulted naves, and this, too, on the principle of the pointed arch. The architects had great difficulties to contend with, and to follow and trace the various steps, in their progress towards the attainment of their ideas of correct stone roofing, forms one of the most interesting studies in the education of an architect. The introduction of the pointed arch at this date (820), is, as we have said, the principal feature of the architecture of the south of France. And the reason for its use is easily seen. The cathedral at Angoulême has three domes along its nave supported by the side walls, and by semicircular arches dividing the whole length of the nave into three squares. This arrangement answered very well as a roof, but was not pleasing either internally or externally in general effect. And with these domes it was impossible to use the one covering to the nave for ceiling and roof. The domes made in proper proportion with the interiors appeared stunted and sunken on the exterior. Shams are never permitted in true art, and so long as there was felt to be a want of truth, so long did the architects struggle until their aim and object was attained. It took years to accomplish, and the lifetimes of generations were spent in the study, but each man added some little step in the right direction, and the end was at last reached. Oh, happy he, who had the satisfaction of completing the discovery! The object to be attained here was one covering — not a ceiling and a roof, but the two combined. The annexed diagram will show the difficulty, and the result attained by the introduction of the pointed arch. If a semicircular ceiling be used, in order that a sufficient water-shed may be obtained, an immense weight must be applied to the crown of the arch, but in the use of the pointed arch all this is done away with. With regard to the plans, a passage round the choir was considered an essential, and this is the commencement of that exquisite arrangement known as the *chevet* of Gothic cathedrals. In order to have this passage within the walls of the church, a screen was erected round the choir, wholly independent of the construction of the church. Later on, chapels were erected, opening into the passage thus provided, and the most perfect and beautiful effect ever produced by Gothic architects, and which perfected the plans of the cathedrals was now wrought out. Most of the churches being collegiate, cloisters are of frequent occurrence, but the outer wall of these is never in the form of unglazed windows as in English cloisters, but a range of small and elegant pillars supporting light and delicate arches is the universal treatment. Spires were occasionally erected, but to the western walls was given the principal decoration. In the Province of Auvergne we find a large number of square towers, many standing quite separate from the churches, but each church has its central tower, while in Anjou, spires are in common use. As a general rule, the churches have only a simple tunnel-vaulted roof over the central aisle or nave; but the semi-vaults of the side aisles are constructed to form a solid abutment against the thrust of the main roof. The side aisles were formed in two stories, the upper of which was an approach to the triforium of later years, and admits light through large windows in the outer walls, but as yet the clerestory had not been developed.









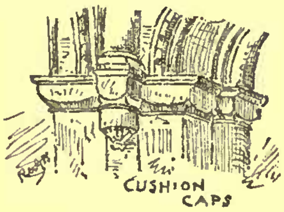


In Burgundy, we find another step has been taken in the progress

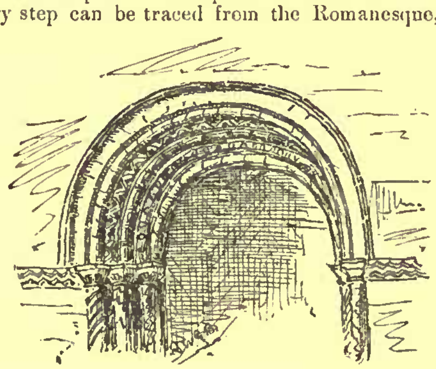
[1] A Sketch of the History of Architecture from the commencement of the Grecian Art to the Reformation in England, by R. W. Gambier-Bousfield, A.R.I.B.A. Continued from page 18, No. 472.

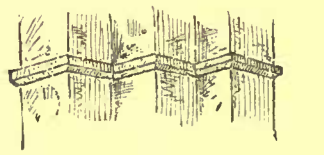
of vaulting; bold transverse ribs and plain intersecting vaults are added to the common tunnel-vault, but the semi-vaults, as in the South, are still used as abutments. But the same difficulty presented itself in roofing the intersecting vaults, and the architects were forced to use again the external wooden roof, but this was no longer a sham, one dome over another, which might be thought to be simply the exterior and interior of the same dome, but the roof was made of an entirely different form, and carried up at an angle from the wall-plates until the two sides met in a ridge, and thus the vaulting became again a ceiling, as in the early Romanesque.

In the north of France we find that a very great stride has been taken towards perfection in the architecture of the cathedral, and other monastic churches. That which is commonly known as the "Latin style," has very many departures from the old lines, and taking, as an example, the Church of Moutiérender, near Vassy, to the east of Paris, we see that the characteristics are the subordination of the side aisles to the central one, and a perfectly-defined clerestory. The nave, or body of this church dates from the eleventh century, and is perfectly plain and devoid of all ornament, either painted or carved; but the chancel, rebuilt in the thirteenth century, is an almost perfect example of true Gothic. In this church almost every step can be traced from the Romanesque, and one sees at a glance what rapid progress has been made in the art in the three hundred years. Every part of the later choir is fitly ornamented, and though in many of its details there was great room for improvement, the style as here represented is complete.

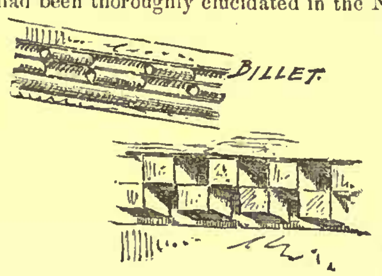




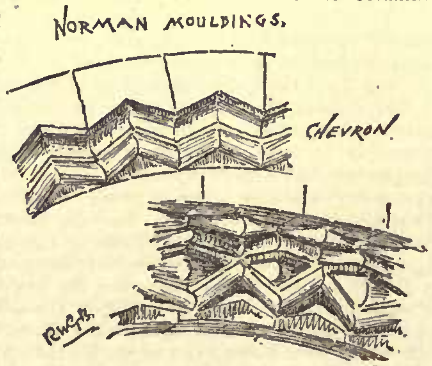


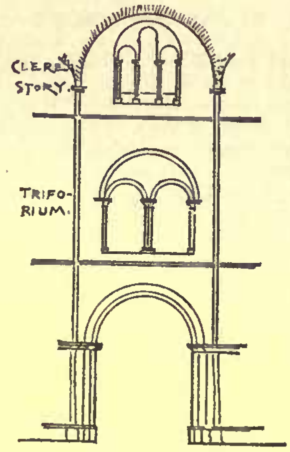


The history of the round-arched, or Norman Gothic architecture, may, with only a few exceptions, be comprehended within the space of one hundred years. No building in this style is known to have been commenced before the year 1050, and before the year 1150, the pointed Gothic had been thoroughly elucidated in the Norman Province. The Norman style embraces the very plainest, as well as the very richest work, from that characterized by the low square pillars and circular piers, to the florid decoration of which so many examples are to be found in England. The former of these exhibit but massive and clumsy remains of Classical principles, but they display a grandeur and solemnity of appearance, consequent upon the solidity of the masonry, and the smallness of the openings. The piers of the earlier buildings were either entirely square, or else a succession of receding faces, capped by a plain, square abaci, the lower edge of which was chamfered. Isolated circular columns were also used, but at later periods portions of columns were attached to the square piers, and those facing the nave were carried up to the clerestory windows, and from their capitals sprang the ribs of the roof-groining. The arrangement of the bays in Norman cathedrals usually consisted of three tiers. The lowest opening was spanned by one semicircular arch. In the second tier or triforium were two smaller arches supported in the centre by a slender column, and these were enclosed by a larger arch, the span of which was rather less than that below it. In the third, or clerestory, there were generally three arched openings divided by small shafts, and forming either a window or an opening before a window in the thickness of the wall. These three arches occupied a space equal to the arch below them, and were enclosed in an arch, springing from a shaft which was attached partly to the wall, and partly to the shaft that supported the springing of the groining. The western and southern doorways appear to have been parts upon which the greatest amount of enrichment was bestowed. The arches were composed of a succession of receding arches enriched with bold mouldings resting on caps, under which were ornamented shafts and bases. The finest example of Norman Gothic as it was perfected in France is at the great Church of St. Etienne, Caen. This is three hundred and sixty-four feet long now, though originally it is supposed to have been shorter, and to have terminated in an apse. A *chevet* was added about a century later. At the western end was the principal entrance (lateral entrances were not used at this date), and this was flanked by two towers. This, later on, became a most important feature in French churches; but it was not confined to the west end, when side entrances were introduced, they were treated in a similar manner. The attempt made to erect towers at the intersection of the nave and transepts was not successful, and was finally abandoned in favor of towers and spires rising from the ground, at the ends and sides of the buildings. Up to this time churches in Normandy possessed simple tunnel-vaulted roofs, copied from the South, but that which was admissible in the bright South would not suit the northern provinces, and larger windows were found to be a necessity. Several attempts were made to meet the requirements, but they found a difficulty in piercing their walls without weakening the supports of the heavy roofing. They began by erecting their piers of greater size, until they were in themselves, strong enough to resist the thrust of the vaults. They next erected a quadripartite vault, making a square of the width of the nave, ignoring the intermediate shaft, and throwing a single arch across to every other pier. This was not satisfactory in its appearance, and a compromise was adopted, and a sort of intermediate vault spring from alternate piers was introduced. This gave the necessary height to the side walls, and consequently plenty of window space, but though mechanically correct, from an artistic point of view it was very unpleasing. But in spite of all the ingenuity expended upon it during this hundred years, nothing was arrived at that could be called perfectly satisfactory. And now we come to a very important point in our history, and one to which particular attention should be paid. Our architects had recourse to the *pointed arch*, and the problem was solved. This feature enabled them to raise the side walls where they pleased, and the plan of the groining was altered, so that each bay was complete in itself. Great progress was made during the twenty or thirty years that elapsed between the erection of the Church of St. Etienne, and that of the Abbaye aux Dames. The triforium at the former was a great gallery, but in the latter was reduced to a mere passage. The bare spaces on the walls



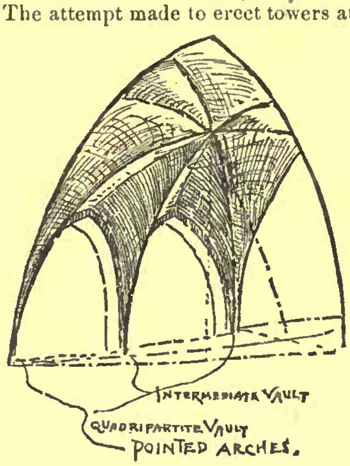
NORMAN MOULDINGS.



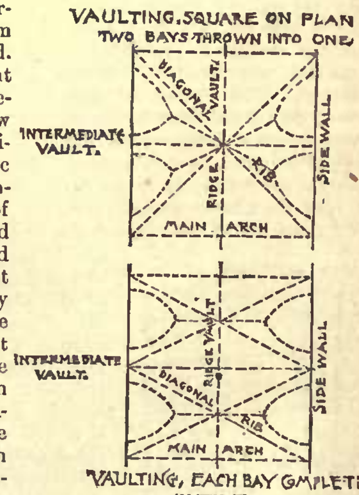




NORMAN FREEHAND CARVING. ELY. ENGLAND.



VAULTING. SQUARE ON PLAN TWO BAYS THROWN INTO ONE.



VAULTING, EACH BAY COMPLETE IN ITSELF.

were felt to be in need of decoration, and the stones were carved in simple geometrical patterns, which had hitherto been only painted.

THE EXCAVATION OF OLD BUCKFAST ABBEY.



Maryleport St Bristol: Eng.

THE work of bringing again to light the foundations of of the Cistercian Abbey of Buckfast, in Devonshire, which was begun in December, 1883, has an interest which may well extend beyond the limits of England. To the student of the past, the remains are like illustrations to the history of the reign and fall of the monastic power in the island; to the architect the peculiarities of construction in the church, and the fragments of carved stone, which show every successive style from Norman to late-Perpendicular, have also a distinct professional value; while to the uninitiated but thoughtful observer, to whom impressions are the compensation for technical ignorance, the ruined abbey, with its monkish owners under a vow of silence, will have the singular charm which belongs as much to its remoteness from that world which is too much with us, as to its traditions of another faith, among generations with other thoughts, aims, and standards than our own.

Of twenty-six monastic houses in Devonshire suppressed at the Dissolution, Buckfast, and Tavistock Abbeys were the only ones which dated from before the Conquest. The reason for this is, briefly, that Benedictine monasticism in the west of England was much more slowly developed than in the east, the Saxon conquest of Devonshire not having been completed until the middle of the eighth century. The Saxon was the friend and champion of the Benedictine monk; the native Briton, his uncompromising foe. The Saxon brought in Roman priests as he advanced; the Celt sullenly fell back inch by inch before them. Still "on the day, when King Edward was alive and dead," to use the picturesque language of the Doomsday Book, the lands of Buckfast were vast and scattered, of almost the same extent in the reign of the Confessor, as in those of Henry VIII. Among the items of property, owned by the Abbey in the reign of the former king, were six hundred and seventy sheep, which is an indication of what was afterwards its chief source of wealth, namely: wool and woolen manufactures. This latter industry still remains, for a large wool factory, built on the site and out of the materials of the ancient abbey, seems by one of *Times's* pleasantries, to be flourishing upon the misfortune of the former masters.

Magnificent indeed, must have been the abbey buildings in the days of their greatness, covering several acres of land, owning nine manorial estates, which extended for miles around it; the abbot ruling over all as a feudal lord, having the power of life and death.

A traveller, one Mr. Laskey, in the *Gentleman's Magazine* for 1796, has left a valuable account of what he saw there in that year, but the masses of stones piled one upon another, which he describes have disappeared, in spite of his prediction that they were likely to remain in that state for ages to come. Mr. Hamilton marks [1] very clearly the three distinct monastic revivals which the abbey has seen, the first being between 1112 and 1145, when, through some circumstances which do not appear to be clearly understood, the abbey was incorporated with the Benedictine Congregation of Savigny, known as the Gray Monks; and it was at this time that its connection with the House of Pomeroy began. Ethelwerd de Pomeroi did not indeed institute the monastery, the origins of which were Saxon, although several ancient accounts of Buckfast give him the credit of so doing; but the grateful monks, after the manner of the Greek panegryists, ascribed to him this honor, on account of his munificence to the Benedictine house; for, as we shall endeavor to prove, architectural history shows that the abbey whose foundations have just been laid bare was erected at this period.

In 1148, however, the thirty monasteries forming the Savigny Congregation, passed into the hands of the Cistercians, whose head, St. Bernard, was still living. The golden age of that reforming sect had just begun; the first fervor of an enthusiasm to purify monastic life from all touch of worldliness was upon the monks of that Order. Furs, rich skins, superfluous habits, soft beds, the "use of fat bacon, and other like extravaganeies" were to be far from them. They wore no shirts, ate no meat except in grievous sickness; no fish, eggs, milk nor cheese, unless on extraordinary occasions; they rose at midnight, sang psalms until daybreak, and spent their days in labor, reading or prayer. Empty conventionalities and dead forms were swept from their foundations by this advancing tide of passionate conviction. The Order had one hundred and nine monastic houses in England alone at the close of the fifteenth century: Waverley was the first, Tintern, Fountains, and Furness were others; nineteen years after Waverley, Buckfast passed under this rigid rule. Mysterious and stern the Order of St. Bernard seems to us; its votaries lived under a vow of silence; yet one has written of it that the dying monk passed from the joys of Clairvaux to the joys of Heaven.

Certainly Buckfast Abbey flourished at this time. The woolen trade began; the kings, one after the other, confirmed the charter of its privileges, all but King John, who appears to have been a little erratic in his dealings with the clergy; and it had one slight disturbance from King Edward I, who summoned the abbot to give reasons for his many claims to privileges, but who afterwards dropped the subject. Once this latter king came to Buckfast for the night, doubtless for pecuniary rather than religious reasons, and the old arch under which he passed is still standing over the roadway. But although these were the great days of the abbey, from the worldly point of view, yet they marked its decline. The rigors of the monastic life relaxed steadily under all this prosperity; wine was allowed among the monks; no more dinners of beans or peas were served on the refectory tables; and they could see no longer any religious virtue in "digging in the earth, cutting wood, or carting manure." Many people of culture and good family entered the abbey now, where meat and wine were to be had freely, combined with education and spiritual advantages. It became a seat of learning, but for a short time only. Gradually the number of monks dwindled away; the immense abbey had only thirteen when the Dissolution came. "Piety groweth eold, but few persons come to religion in these days," wrote a mournful Buckfast monk, as early as the year 1400. [2] It is almost pitiful to read in the old chronicles the little items which tell so surely of a steady decay; the broken silenee which passed uncorrected, the aged abbot whose government was taken out of his hands by the brethren; the continual petty lawsuits between the abbots and their neighbors about the stealing of rabbits, and the blocking up of fish-ing-ponds. Yet, on the whole, the century preceding the Dissolution was a peaceful and uneventful time. The monks appear to have been generally kind and benevolent to the poor about them. If the enthusiasm of a fervid faith was passed, evil and excess did not come in its place; no scandal attaches itself by chronicle or tradition to the failing greatness of Buckfast. The rushing wind of the Spirit had become an idle summer breeze.

The day of little troubles was over in 1535. In that year the visitors appointed by King Henry VIII, made their appearance at Buckfast. The abbot was dead; they appointed one Gabriel Donne in his stead; a worldly man, with an eye to the main chance he seems to have been, and he surrendered his abbey to the king in 1538, receiving an ample pension equal to $9,000 at present. [3] All the monks were allowed lesser sums yearly, except the prior, who received nothing, which seems to show that he did not agree to the act of surrender. Then the monastic buildings were promptly sold to Sir Thomas Dennels; the lead was stripped from the roof and disposed of; the five bells went with it, and the abbey buildings were left to the gentle death of time. But round them raged the battle between the old faith and the new. There was an attempt in 1549 to force the Protestant serviee upon the eounty. The people rose to arms, led by a descendant of those Pomeroys who had for centuries been the abbey's friends; ten thousand peasants took part in it. Lord Russell marched against them, defeated them, burned and wasted the country for miles, and killed four thousand of the people. The Roman Catholic leaders were executed, and the last flicker of the spirit of the early religion was extinguished. The abbey passed from hand to hand until 1806, when a Mr. Berry bought it, levelled most of the walls remaining, and built a new house out of the materials. This building was purchased in 1882, by Benedictine Monks of the Primitive Observance, who had been expelled from France in 1880; and there they have retired to their strict and silent life, the first Order to restore a monastic house in England since the reformation, and the third revivers of the ancient faith within Our Lady of Buckfast.

Except the archway over the road, virtually all that remains of the old structure is what is known as the Abbot's Tower, an ivied ruin which joins the north side of the newly-erected chapel, and this is believed to have served as an angle of the monastic buildings, the tradition which makes it the abbot's quarter is, of course, architecturally impossible. It is of the fifteenth century, more modern than the arch, and contains much that is interesting. It is 19 feet square, and about 40 feet high, although the turret staircase at the angle rises about 10 feet higher. The tower was divided in the monk's days by three floors into four chambers of varying heights, which are clearly indicated by holes where the massive beams were formerly inserted. The two upper stories were provided with fireplaces, now much mutilated, and with quaint little windows at the sides. The almost ruined stone tracery to the large windows of the upper chambers still exists, but that of the lower window is completely destroyed, only the rough jambs and relieving-arches remaining to show its former position. No fireplaces appear in the two lower chambers, which were not so high in the walls as the others. In each of the four rooms is a rough opening where was formerly a door leading into the adjoining buildings. The spiral turret staircase is quite perfect from top to bottom; the doorways opening from it into the chambers are all destroyed, except the top one, which still keeps its original stone jambs and lintels. A curious and picturesque feature of the tower is a series of latrinal chambers, opening out of each of the three upper rooms. A stream of water, an arm of the Dart, once flowed beneath a part of the abbey buildings adjoining the tower, and a portion of the rough arch vault over it was to be seen until quite recently. A continuation of the same vault is known to be still remaining under the modern Abbey House. The tracery of the upper windows, before

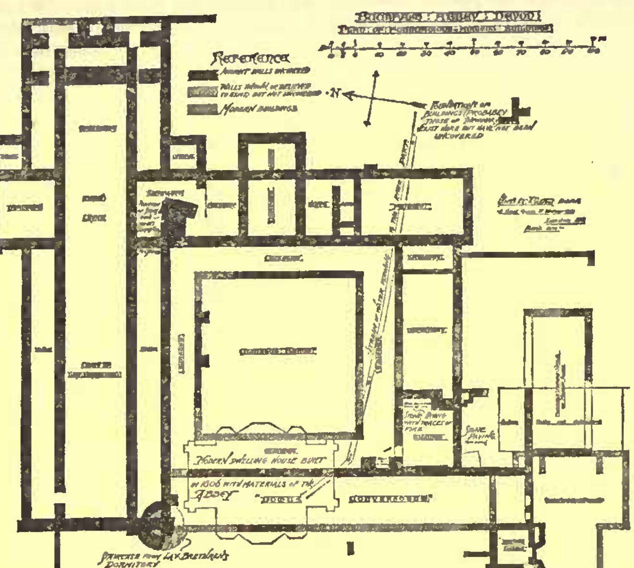
[1] "*Buckfast Abbey.*" A pamphlet by Rev. Adam Hamilton, O. S. B., 1884.

[2] *Sloane Manuscripts*, in 513, British Museum.

[3] "*Historical Collection relating to Devon.*"

spoken of, is of freestone, and shows very beautiful and delicate details, while the remains of parapet, buttress, and weatherings which are mostly of the local granite or marble, are bolder and simpler in character, although of the same date.

An association, calling itself the Buckfast Abbey Restoration Committee, obtained the services of Mr. Frederick Walters, a London architect, and in December, 1883, began excavations on the site. These have already brought to light the complete plan of the foundations of



the ancient abbey church; the cloister, chapter-house, fratry, refectory, and kitchen have been clearly determined. The lay-brother's dwellings, which it is said have been found do not appear upon the plan. The church, which is nearly 220 feet long, shows some notable architectural peculiarities. It is remarkable for its excessive length and narrowness, probably arising from the same reason which led to similar proportions in the Assyrian palaces, namely the inability of the builders of stone vaults to cope with great spans. The columns which separated the nave from the aisles, were supported in the foundation by massive continuous walls, instead of isolated piers. The transepts are divided into two unequal parts by solid walls, one of which continues across the chapter-house, and the southern end of this latter forms the eastern enclosing wall of the building. The effect of these transverse walls was to narrow the transepts in the same way as were the aisles. Parallel transverse walls at the end of the church seem to denote most interesting constructive peculiarities in this position. It is to be regretted that the plan gives so little information as to the arrangement of the apses. A massive wall at the western extremity of the south transept probably marks the position of a staircase which once mounted to the dormitories above the cloisters. This monumental ascent must have occupied all of that portion of the south transept which extended beyond the main body of the church. The details of the superstructure, specially the intercolumniations and vaulting, cannot fail to be of historic importance, and it is to be hoped that further information concerning it will be given us later on in the work. The monastic buildings appear to have had three distinct divisions; the *domus conversorum*, so-called by Mr. Walters; the great square cloister, which was 95 feet from wall to wall, and 65 feet within the arches, in which the general rule that cloisters of abbeys were south of the church, while those of cathedrals were at the north of the building, has been carried out; and, grouped upon two sides of this cloister, the chambers of the monastery itself, in such a way that the accommodations of every-day life, kitchen, refectory, and lavatory were isolated from the chapter-house and fratry. The latrines and the chambers in the so-called Abbot's Tower were still farther removed from the dwellings of the friars, being wholly outside of the group. The identification made by Mr. Walters, of the halls in the east of the cloister as the *domus conversorum* is at least questionable, as the comparative size of the halls does not agree with the small chambers for conversation usual in other monasteries of this character, where also they are invariably in more direct communication with the chapter-house. The striking architectural parallels of the Cistercian abbeys of France would lead us to expect a mass of farm buildings on the east of the cloister.

The word "slype," used by Mr. Walters upon the plan to designate one of the chambers, is a stumbling-block, no such technical term[1] being in use; but according to the analogy of Clairvaux, we should suggest that the space so indicated might have been the *domus conversorum*.

Viollet-le-Duc defines the topical arrangement of the cloister in Cistercian abbeys as follows; "An entrance adjoining one of the walls of the nave, with an entrance near one of the transepts; a gallery at the west, next to which lie the buildings of the lay-brothers (*étrangères*), or magazines and cells entered from without; a gallery at the east opening into the sacristy, into the chapter-house, and the ecclesiastical offices; and finally, the gallery opposite to that adjoining the church, communicating with the dormitory and refectory." This general form and arrangement, as well as the other interior architectural features, were mainly determined by synods of the ninth century, the officers of the church having previously lived in dwellings in the town, and the disposition thus adopted was retained with some modifications of detail, until the sixteenth century. Although abbeys had two cloisters according to the conventional form, no trace of the smaller one, that devoted to the more intimate requirements of the abbot, which should be behind the apse, is to be found in the plan, The Cistercians at first adopted as we know, a peculiar style of cloister, heavy, bold, undecorated, giving up delicacy for force, but this character began to be modified by the end of the twelfth century, marking the relaxation in the conventual line.

The fragments of carved stone show, as we have said at the beginning of this article, every successive variety of style in the abbey building from Norman to late Perpendicular. The church and cloisters appear to have been paved with encaustic tiles, the prevailing color being bright yellow, varied by blue and green in the body of the church, and laid in various patterns in the chapel and cloisters. Of course the relics found have been few, for barely the line of the walls is as yet excavated; still some minor discoveries are of interest, a seal of a bull of Pope John XXII, a diamond pane of stained glass with the figure of a pelican, and two mediæval spoons, being among them. Since the return of Mr. Walters to London the work has been going steadily on under the superintendence of the Rev. Adam Hamilton, one of the monastic owners of the site.

Viollet-le-Duc gives a description of the little oratory of St. Jean-les-Bons-Hommes, between Avallon and Savigny in France, built towards the end of the twelfth century, in which the plan, simple as it is, contains all the chief elements which appear in the majestic abbey of Clairvaux, and apparently in other Benedictine monasteries of the same age. In the plan of Buckfast, now recovered, it is interesting to note how the simple form of this little Savigny priory underlies that of the Cistercian abbey which succeeded it. These architectural parallels of St. Jean-les-Bons-Hommes and Clairvaux, enforce the arguments which are to be derived from the historical events related above to prove the Abbey of Buckfast, in the arrangement at present recognizable to be a creation of the twelfth century. It will be seen by these particulars that the importance of such a characteristic and eminently well-arranged monastic plan to architectural history will not be inconsiderable.

It is now intended to rebuild the abbey on its ancient foundations. When it is finished it will stand like its predecessor on the right bank of the Dart River, amidst the picturesque and varied scenery of Devonshire; three-quarters of a mile from the little village of Buckfastleigh, with its one narrow street, and its houses built of the stones of the old abbey. Not far from its towers will be the remains of two encampments supposed to have been left by the Danes; across the moors, the green path still called the Abbot's Way, will mark for the visitor the post-road for the conveyance of wool in the days of the Cistercian Friars; and Dean Prior, not far away, will add its interest to a scene already rich in suggestion and romance, as the birthplace of Herrick, the spot where the greater part of his Hesperides was written, and in whose churchyard he lies buried. M. G. M.

[1] "Slyp" or "slype" is an architectural term, nearly obsolete, however, and denotes a passage between walls.—Eds.

LONDON'S NEW TOWER BRIDGE.

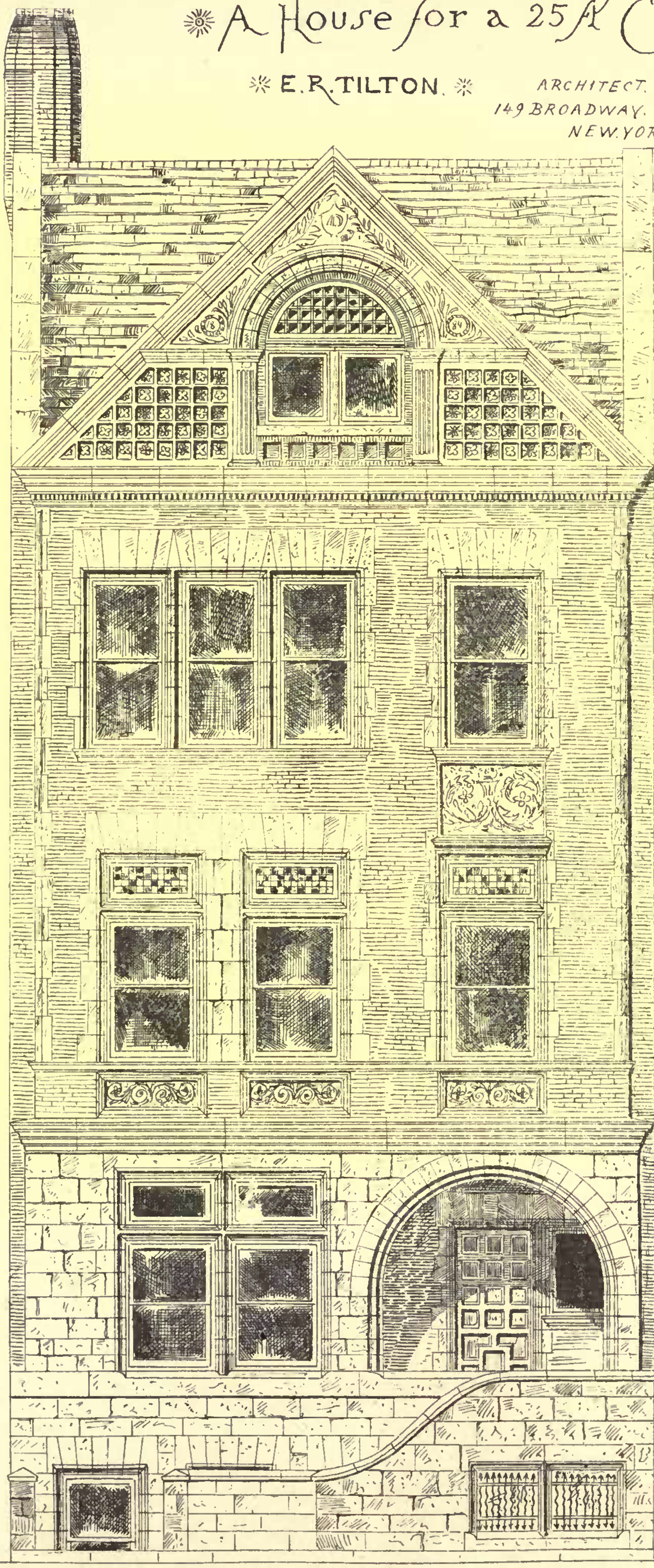


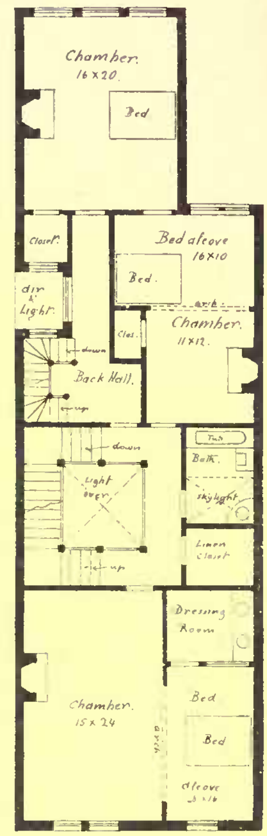
At last there is a prospect that an old and obstinate grievance of Londoners is about to be in a measure removed. After long waiting, much complaining, the sitting of innumerable committees, the proposal and rejection of innumerable projects, the lower Thames bridge scheme appears to have taken a practical shape, and to be in a fair way of being carried out. Yesterday the Court of Common Council was specially convened to hear the report of their Bridge House Committee on the question. The report was almost identical with the recommendations of the Select Committee of the House of Commons which were issued last July, and it received the unanimous approval of the Court.

The plan now accepted is not, indeed, final, since it only deals with a part of the question: but it is a beginning, and it is more than the proverbial half of the whole. It may be remembered by those of our readers who have followed the long history of this matter that some years ago the Metropolitan Board of Works took up the question, and that their engineer recommended three new crossings; a high-level bridge at the Tower, a tunnel at Shadwell, and a tunnel at Blackwall. The high-level bridge was of course suggested with the view of not interfering with the passage of ships; but its cost would have been enormous. With its approaches and with the two tunnels, the expense would have amounted to more than five millions sterling, a sum which could only be raised by some exceptional measure. The measure proposed was the continuance of the corn and wine dues; but that was refused by the Treasury in a celebrated minute of Mr. Courtney, and consequently the whole plan fell through.

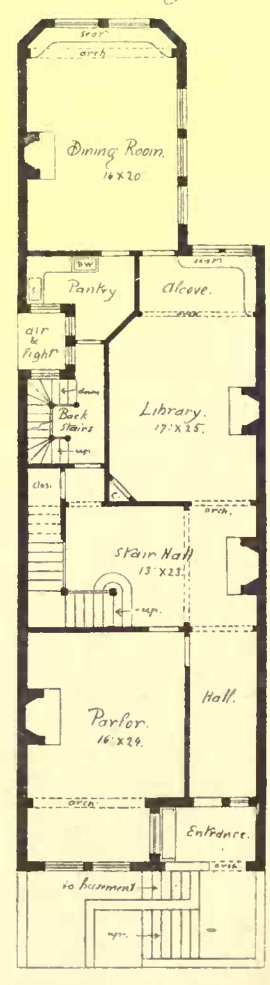
A House for a 25 ft City Lot.

E. R. TILTON. ARCHITECT.
149 BROADWAY.
NEW. YORK. CITY





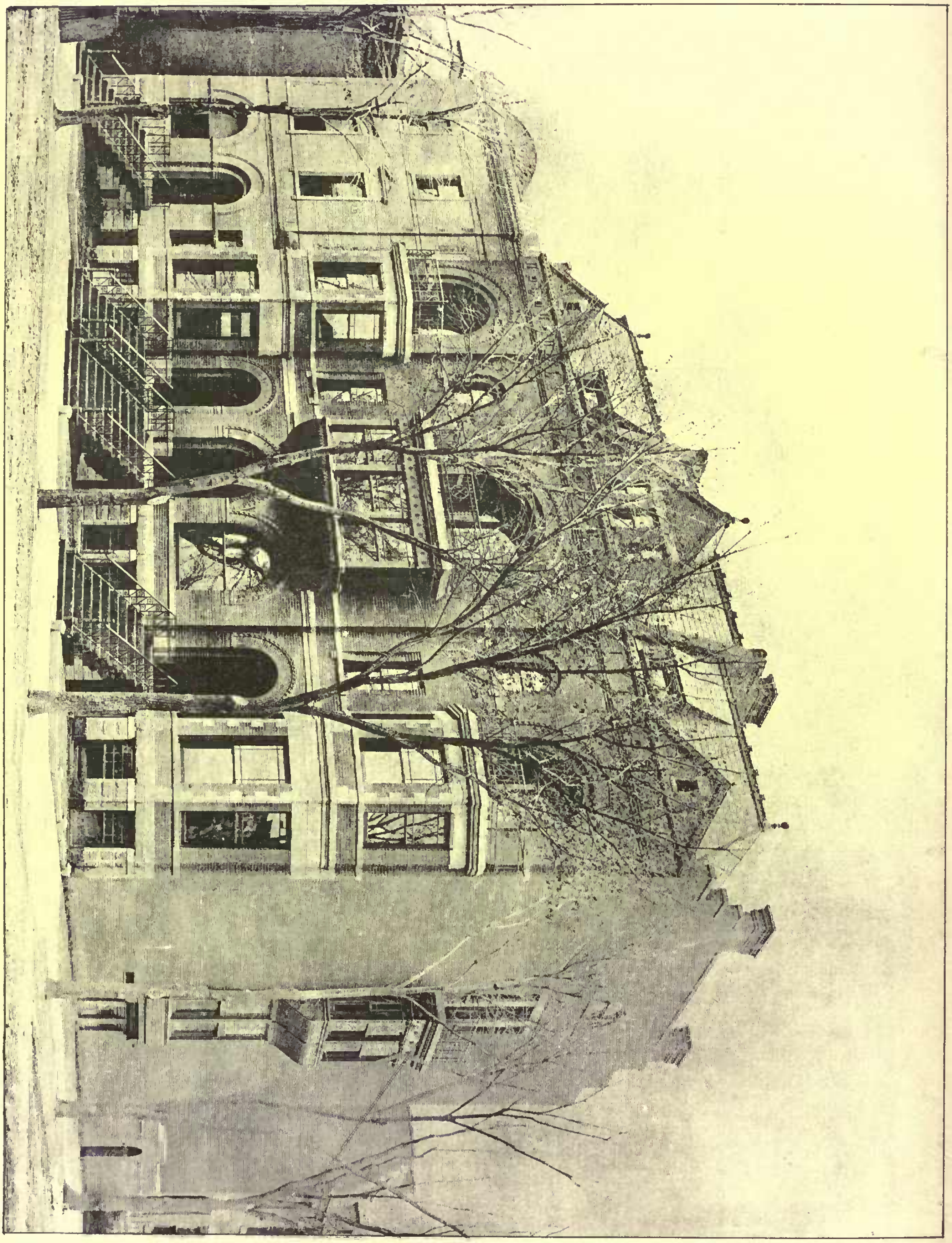
Second Story Plan



First Story Plan

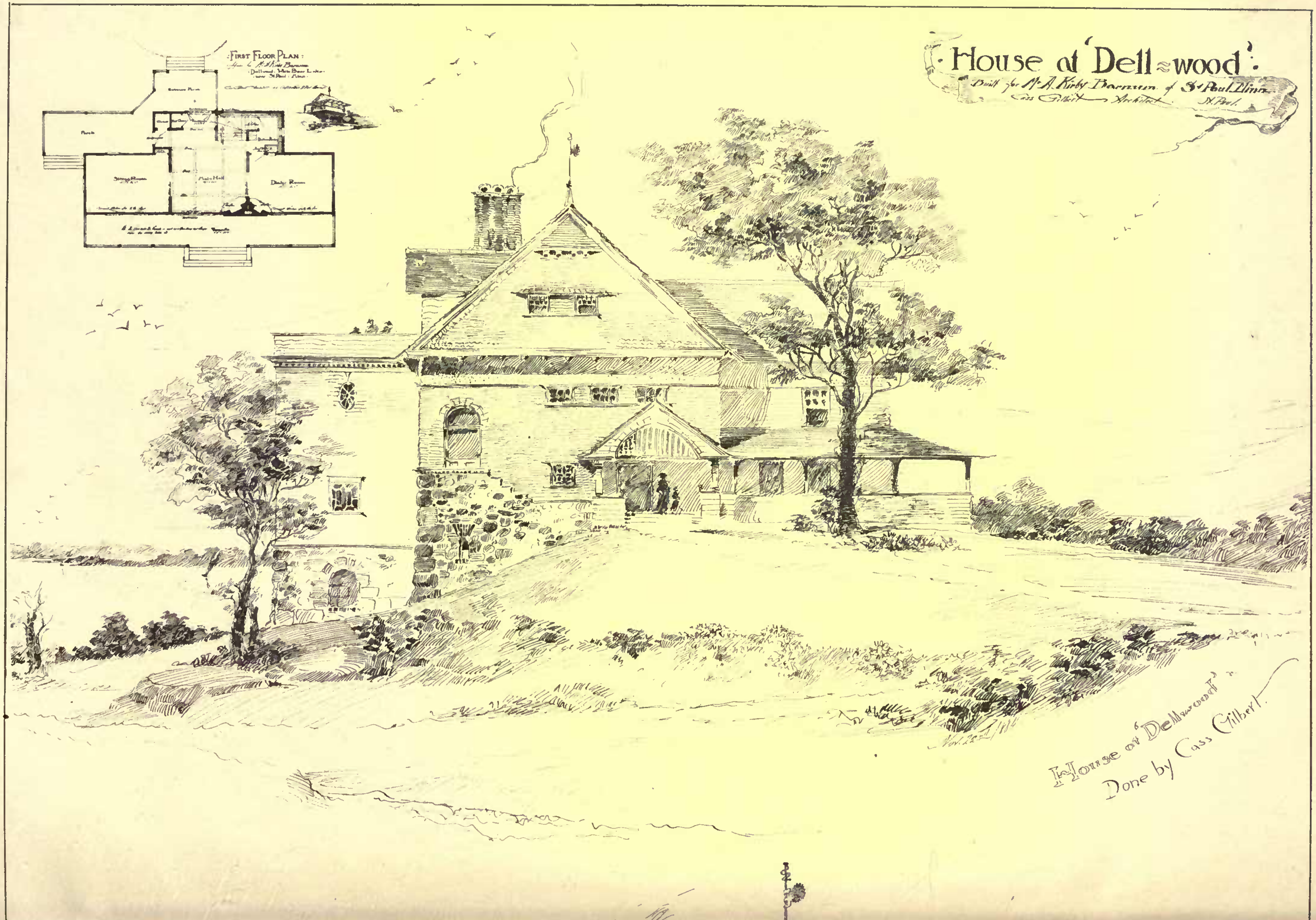
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FRONT ELEVATION.

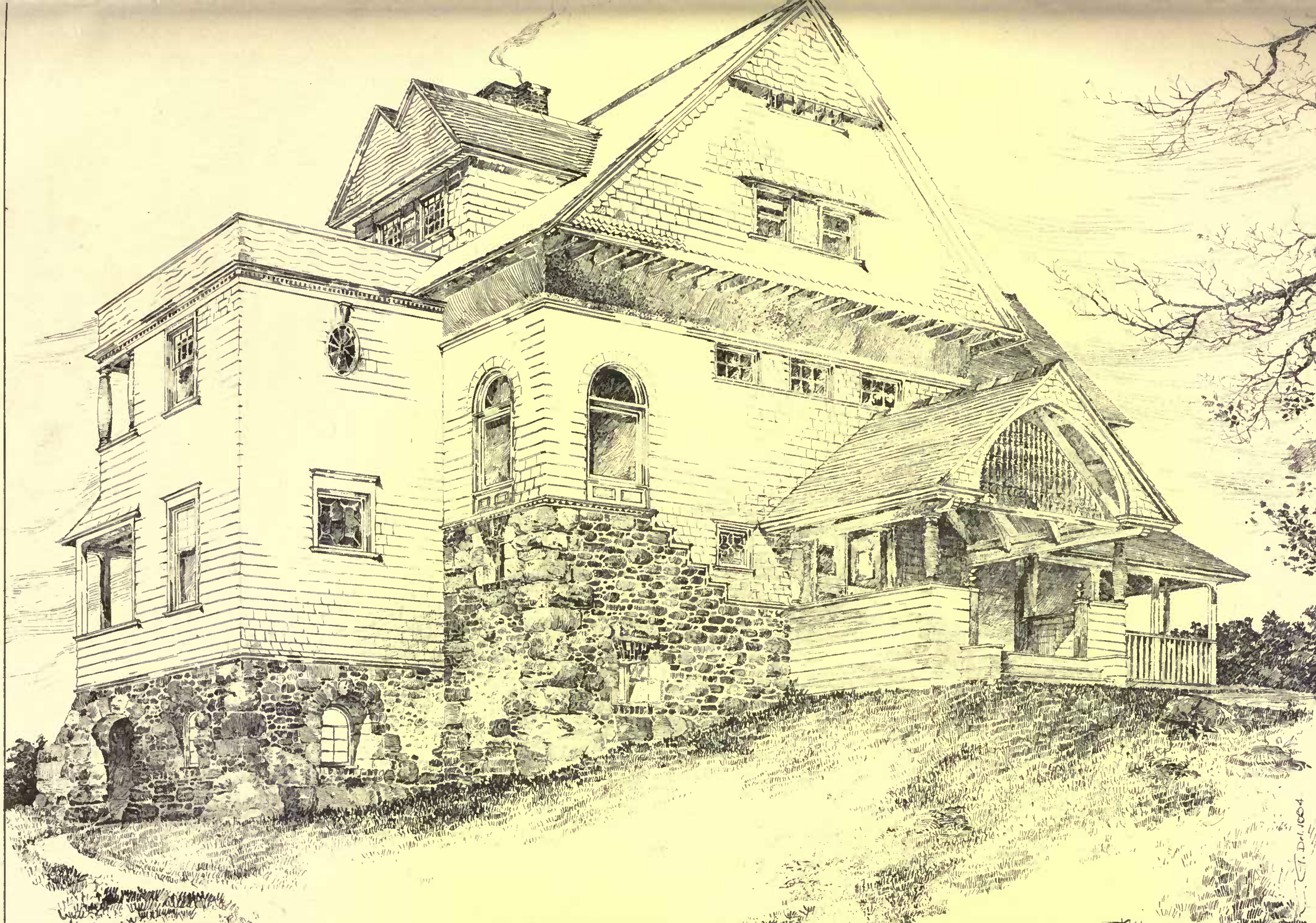


BLOCK OF HOUSES FOR THE APPLETON ESTATE, ALBANY, N.Y.
WALTER DICKSON, ARCHITECT.

PHOTO CAUSTIC, HELIOTYPE PRINTING CO. BOSTON



First Floor Plan:
House at 'Dell-wood':
Built for Mr. A. Kirby Barnum of St. Paul, Minn.
Cass Gilbert — Architect — St. Paul.
House at 'Dellwood'
Done by Cass Gilbert.



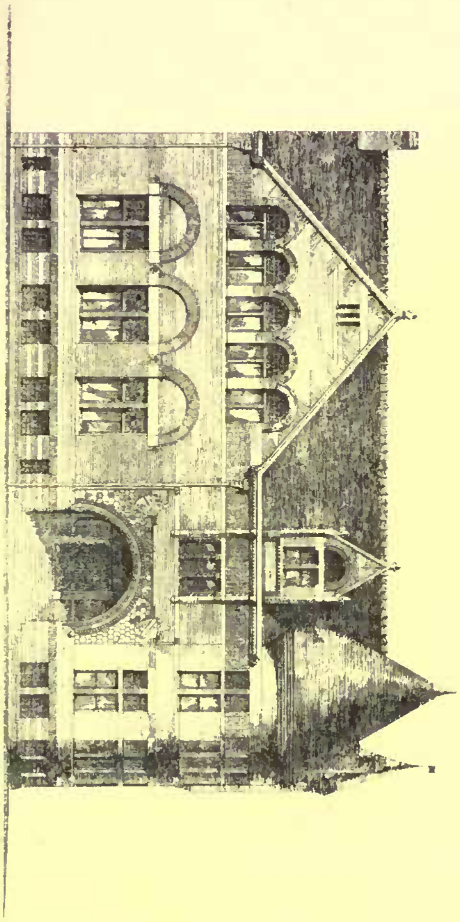
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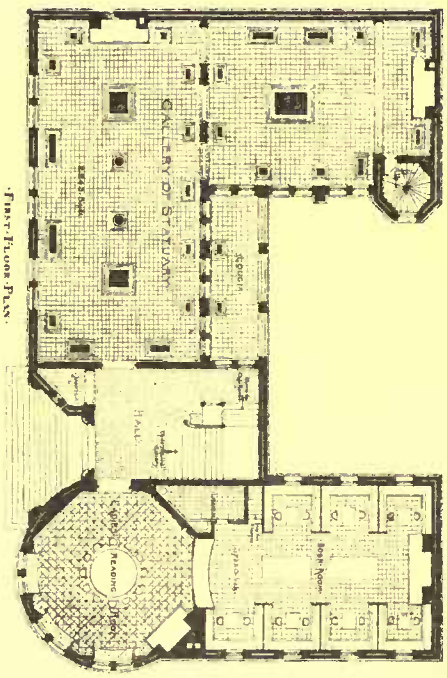


PHOTO CAUSTIC, HELIOTYPE PRINTING CO., BOSTON.

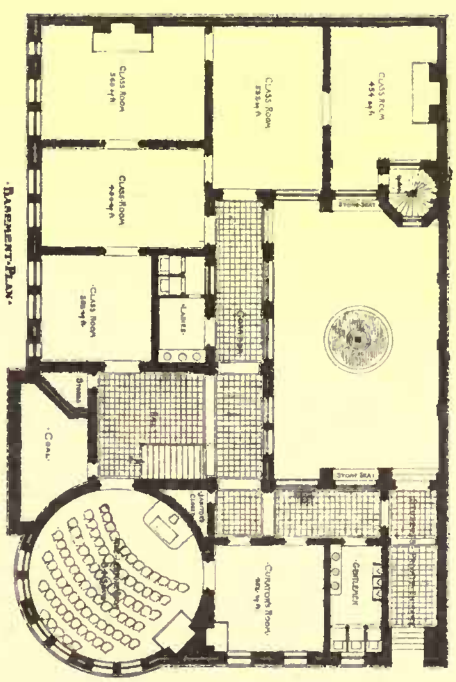
Cathedral, Orvieto, Italy.

American Architect and Building News, Jan. 17 1885 No. 473

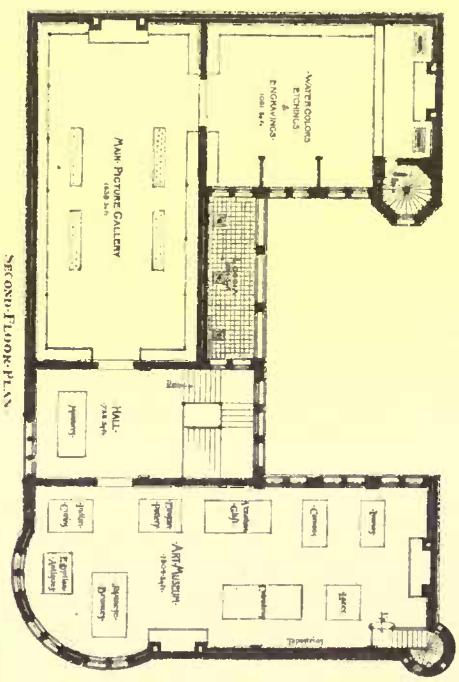




·First·Floor·Plan·



·Basement·Plan·



·Second·Floor·Plan·

·Museum·of·Fine·Arts·
·and·
·Ladies'·Library·
·Charleston·S·C·

Last session two bills were introduced, one promoted by the Board of Works for a subway about a mile below London bridge, and one by a private company for making a "duplex" bridge at the Tower. Both plans were discountenanced by the Select Committee to which they were referred, the one because the subway seemed to be not rightly placed, and the other because the duplex bridge was thought to be in many ways a questionable experiment. The Select Committee then made their own recommendations, which included a low-level bridge, with a swing opening at Little Tower Street, and a tunnel at Shadwell, the tunnel at Blackwall being deferred for the present. The convenience of this low-level bridge is plainly much greater for traffic of all kinds, and its cost much less than that of the high-level bridge would have been, while the interference which it would cause to the shipping on the Thames was thought likely to be small. The committee urged the corporation to take it up, believing the expense would not be greater than the Bridge House Estate could fairly bear. The Shadwell Tunnel was to be the affair of the Board of Works.

It is to be regretted that the Board of Works at their last meeting determined to shelve the question of the tunnel and merely to apply to Parliament for permission to establish "free ferries" at Greenwich and Woolwich. This is avowedly a mere makeshift, and its proposal is not very creditable to the energy of the Board. The corporation, however, is on its mettle. With the fear of Sir William Harcourt before its eyes, it has undertaken to show the inhabitants of London and a hostile Parliament that it can and does work for the public benefit. The proceedings yesterday were singularly harmonious, and ended in the prompt adoption of the Bridge House Committee's report, recommending the immediate construction of a low-level bridge at the Tower. The precise position is from Irongate Stairs, at the bottom of Little Tower Street, which lies to the east of the Tower of London, to the narrow street called Horsleydown. Provision is to be made for the shipping by means, not of a swing opening, but of a "bascule" or lifting section, this being, in the opinion of the experts, the easiest and simplest method of opening the bridge. It is supposed that an average of three minutes will suffice to allow the passing of a vessel; and as the average of vessels has lately been only 14.3 per day, and has never during the past year exceeded 23 per day, it may be supposed that the bridge traffic will never be stopped for more than an aggregate period of an hour during any one day. The length of the bridge will be 880 feet, its width 50 feet, and the height of the centre above high-water mark 29 feet, which is the same as that of London bridge. The gradients will not be steep; on the northern side, on which the bridge will spring from comparatively high ground, being 1 in 70, and that on the southern side, 1 in 40. There will be two piers only in the tideway, and between them there will be a clear space of 200 feet for the passage of vessels, the movable part of the bridge, of course, starting from these piers. The committee do not dwell upon the great size and consequently enormous weight of this movable section, but we may suppose that the engineers see no insuperable difficulty in raising by hydraulic machinery, two divisions each 100 feet long. Lastly comes the question of cost, and here the corporation estimate does not differ from that arrived at by the Parliamentary committee. It is to amount, including the expense of the necessary approaches, to £750,000, and this sum is described as "not beyond the resources of the Bridge House Estate." — *London Times.*

THE ILLUSTRATIONS.

PROPOSED MUSEUM AND SCHOOL OF THE FINE ARTS, CHARLESTON, S. C. MR. WM. MARTIN AIKEN, ARCHITECT, BOSTON.

THE plans show a building enclosing three sides of a court, with fountain and seats, and situated at the intersection of two streets; the main entrance being on the principal street, with a side entrance in the basement for the students and employés. The plan of this floor shows a large room for lectures or general classes, and gives moderate-sized rooms for special classes, which are further supplemented by rooms for the same purposes in the attic. There are also rooms for the curator, janitor, the lavatories, coal and stores; a corridor or cloister paved with tiles and enclosed by casement sashes, gives access to most of these rooms, and the tower in the courtyard contains the janitor's staircase. The main entrance hall, is reached both by a wide stair-way from the basement and by broad steps from the street, flanked by the janitor's office on the left, and the library (which occupies the entire wing) on the right — the book-room of the library is in two stories of eight feet each, lit by windows on either side of each story — the remainder of this floor is devoted to statuary and casts. The loggias on both stories being fitted with glass, act as supplementary galleries to this department. The principal room on the second floor is the picture gallery, lighted by a group of windows high up on the front; the other rooms contain the special and loan collections; the left wing being for water-colors, engravings and etchings; and the right wing being the collection of curios and bric-á-brac in glass cases. The raised floor of the chimney bay in the water-color room, and the stair-cases both here and in the corner of the library wing, and the large fire-places in each room offer points of vantage for the display of numerous collections. The janitor's apartments occupy one wing of the attic, and a series of studios the other. Building stones being a rarity in this section only the steps, water-table, sills and lintels are of this material; brick, in two shades of red, and a limited amount of terra-cotta are used elsewhere. The walls have air-spaces, and the interior construction is intended to be of the open timber or "slow-burning" method, except in the basement where tiled floors with abundant air-space under them are used. The interior wood-work to be of Southern pine, staircases of iron.

THE CATHEDRAL, ORVIETO, ITALY.

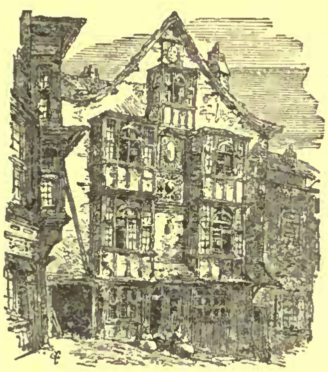
WE published, a few weeks since, a view of the cathedral at Siena, and now reproduce a view of the cathedral which is usually associated with it in description, though it is much smaller and more simple in design — except the façade, which is covered with sculptures and paintings. As thirty-three architects have been employed upon it, it is difficult to say to whom the merit of the work properly falls, but the corner-stone was laid in 1290 for the erection of the building in accordance with the design of L. Maitani, who had just finished his work upon the cathedral at Siena. The building is 278 feet long, 103 feet wide, and 115 feet to the ceiling, which was built in 1828.

FOUR HOUSES FOR THE APPLETON ESTATE, WASHINGTON AVE., ALBANY, N. Y. MR. WALTER DICKSON, ARCHITECT, ALBANY, N. Y.

HOUSE FOR A. KIRBY BARNUM, ESQ., DELLWOOD, NEAR ST. PAUL, MINN. MR. CASS GILBERT, ARCHITECT, ST. PAUL, MINN.

HOUSE FOR A TWENTY-FIVE-FOOT LOT. MR. E. R. TILTON, ARCHITECT, NEW YORK, N. Y.

ELECTRICAL PROGRESS IN AMERICA.



in Pithay. Bristol: Eng.

AT the last meeting of the Society of Telegraph Engineers and Electricians, Mr. W. H. Preece, F. R. S., gave a most interesting discourse on the present condition and future prospects of electrical engineering in America. The author visited America in 1877 in order to inspect the telegraph systems there, on behalf of the Postal Telegraph Department; and his second visit was paid during the recent meeting of the British Association at Montreal and the holding of the Electrical Congress at the Philadelphia Exhibition.

After reviewing the work done at both of these scientific gatherings, Mr. Preece went on to speak of the general progress of telegraphic industry in the United States, remarking that since 1877 we in England had advanced more rapidly than our cousins, a remark which is contrary to the received opinion. It is to be taken, however, in a scientific rather than a material sense, for as Mr. Preece states, the mileage of telegraph wire has increased from 200,000 in 1877 to 433,726 in 1884, while the number of messages per annum has increased from 28 millions, to 48 millions, in the same space of time. The number of offices has risen from 11,660 to 13,600, and the capital invested from 40 millions to 80 millions of dollars. One telegraph novelty had indeed appeared, namely, the Delany multiplex system. Mr. Preece speaks very favorably of this rapid telegraph, and hopes to try it on the Postal Telegraph lines. The apparatus itself will, we understand, be exhibited at the forthcoming International Inventions Exhibition in South Kensington,

Passing from telegraphic to telephonic operations, Mr. Preece alluded to the recent attempt to upset the Bell patents on the ground of Drawbaugh's claim to priority of invention; an attempt which has for the present failed, pending an appeal to the Supreme Court. Judge Wallace has decided that notwithstanding the testimony of some two hundred witnesses who claim to have heard of, heard, or seen the Drawbaugh telephones prior to the date of Bell's patents, the evidence leads to the conclusion that Drawbaugh had not invented a practical telephone prior to that date. The case has extended over four years, and the interests involved are at present valued at 100 million dollars. The decision will, if unreversed, give an impetus to telephony in America by preventing threatened litigation. From 150, the stock of the Bell Company has risen to 250 in less than six months, owing to the termination of the case in the Circuit Court.

The telephone in America (to return to Mr. Preece's lecture) is used on a far more extensive scale than in this country, notwithstanding the fact that it is far more heavily taxed than here, one company being taxed as much as 75 per cent of its receipts. The reason of this is that it is a vital necessity to business, partly owing to the excessive heat during summer. The charges for the use of the telephone are also much higher in America than here, the annual charge for the "law" exchange system employed by lawyers being £44, while the ordinary charge is £35, as against £20 in London. In some American towns, however — for example, Philadelphia — the rate is £25, and in Buffalo they charge by results at a tariff of 6, 5 and 4 cents per call according as the minimum number of calls is 500, 1000, and over 1000 per annum.

The exchange system is very promptly worked in America, the maximum time of "putting through" being four seconds on the

Milwaukee lines. There are 10,600 subscribers to the exchanges of New York alone, whereas in all England there are only 11,000. In the whole United States there are 97,400 circuits, comprising 90,000 miles of wire, and some 517,000 instruments have been manufactured.

Turning to electric lighting, Mr. Preece remarked upon the extraordinary progress it has made in the United States as compared with Great Britain. There are some 90,000 arc-lamps alight every night in the States, and in most of the large cities the streets and warehouses are brilliantly lighted by them. The contrast between New York and London in this respect was, as Mr. Preece stated in a recent lecture to the Society of Arts, most depressing. "On the evening of October 21st," he said, "I drove from the Windsor Hotel, New York, to the Cunard Wharf, a distance of about four miles, through streets entirely lighted by electricity. On October 30th I drove from Euston to Waterloo without seeing a single electric light." One manufacturer told him that he was turning out 800,000 carbons for arc-lamps per month, and another that his output was 50 arc-lamps and 3 dynamos per diem. There are many central stations working regularly, both with arc and incandescent lamps, and more than one electric-light company pays dividends; while the manufacturers seem to be full of work.

The principal systems in use are, for arc, the Brush, Weston and Thomson-Houston; but there are other systems not so well known on this side of the Atlantic, such as the Hochhausen, the Van de Poel, the Western Electric, the Fuller, and the Sperry. The chief incandescence lamps employed are the Edison and the Weston.

In his lecture to the Society of Arts, Mr. Preece entered rather more fully into this part of the subject than at the Society of Telegraph Engineers, and we will therefore refer to some of his observations at the former place.

The Weston system struck him as probably the best in the United States from a mechanical point of view. The great suspension bridge at Brooklyn is lighted by it, forming a very splendid spectacle on a fine night. New York harbor will also soon be lighted. The dynamo is remarkably free from sparking, the "Foucault" currents are checked, the resistance of the armature (.0011 ohm.) is so low as to be negligible, and the dynamo becomes practically self-regulating; while the electromotive force is a safe one, being only 70 volts when the machine is running at 1,000 revolutions per minute.

We need not follow Mr. Preece in his accounts of the various systems above mentioned, as they will be found described in detail in our pages; but we may mention that it is at length decided to light the streets of Ottawa with the Thomson-Houston system by power derived from the celebrated Chaudière Falls. The Thomson-Houston Company have already a central station at Montreal, supplying 164 arc-lamps to the streets of the town at the rate of 50 cents per lamp per night, the lamps being lighted from dark till midnight. Here, as in the case of the Brush central stations, the current is carried by overhead wires erected on posts, the wires being of copper (No. 6 gauge) covered with asbestos and cotton. In Philadelphia Mr. Preece inspected a Brush central station supplying nearly 1,000 lamps and utilizing 1200 horse-power. There were 25 circuits, some four miles long, of overhead wires. The charge for each lamp is $25 per month, which is equivalent to £60 per lamp per annum.

For street lighting the lamps are suspended from tall posts running in a zigzag line and about 50 yards apart. An experiment in general illumination by eight Brush lamps on four iron masts 250 feet high, which Mr. Preece saw at Cleveland, did not recommend itself to him, the streets below being lit by what seemed a very pale moonlight. We may add that the price paid in New York is 70 cents per night, or £50 per annum for each arc-lamp; but a fine of $1.40 is imposed on the lighting company every time a lamp is reported to have been out. This serves as a salutary check on the working of the system.

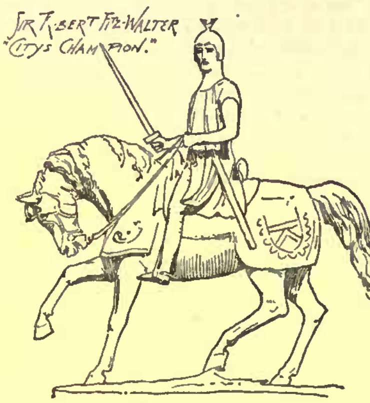
Incandescence lamps are not used in America for street lighting, and for indoor lighting they have not been employed to the same extent as in England, although they have several central stations there.

The Edison and the "tamadine" lamp of Weston are the most promising lamps on this system; but the Swan and the Bernstein lamps are also used. The largest central station is that of the Edison Company in New York; but Mr. Preece saw a very interesting little station at Roselle, a small village in New Jersey, where three dynamos, in series, supply 1,200lamps in three series by means of overhead wires. The charge was a cent per hour for each 10-candle lamp, a price equivalent to gas at $2.50 per 1,000 cubic feet.

Aerial wires are in general use in the States, except in connection with the Edison system. They are in general of copper covered with hemp or cotton, and supported on poles erected along the curbstones. High-tension currents are also in frequent use, and the immunity from accident is therefore surprising. Fires are, however, not so rare, and the currents often leak into the telephone wires. In fact it is becoming the practice to put safety cut-outs in the latter to protect the instruments from leakage currents. Secondary batteries have not received so much attention in America as in England; but the Planté and Brush cells are both in use to a limited extent.

Ship-lighting is becoming very common in America, many of the Hudson River and Lake Superior steamers being lighted by electricity. So also are the ferry-boats of the Pennsylvania Railway. In short, Mr. Preece considers that electric lighting, as a practical problem, has been thoroughly solved in the United States, and that both here and there it will gradually become cheaper. Its peculiar advantages will lead to its general introduction, and one of these, which has been observed in America, is the prevention of crime. The chief of the New York police has even said, "every electric light erected means a policeman removed." No doubt there is some truth in the remark. — *Engineering.*

A TENANT'S LIABILITIES.



COMPETITION FOR EQUESTRIAN STATUES FOR BLACKFRIARS BRIDGE, LONDON. DESIGN BY G. G. ADAMS, SCULPTOR.

At this season of the year, when so many houses change hands, it may be useful to draw attention to the liabilities incurred by tenants. The following definition of dilapidations is pretty clear, and might lead to a more amicable agreement between landlord and lessee if known. "Dilapidations are those defects only which have arisen from neglect or misuse, and not to such as only indicate age, so long as the efficiency of the part remains. But if the effects of time or age have proceeded so far as to destroy the part, or its efficiency in the structure, this argues neglect or misuse; it being the presumption that, at the commencement of his term, the tenant was satisfied that every part was sufficiently strong to last to its close." Under the ordinary covenants a lessee is liable for the efficiency of every part of the premises, even those parts erected during the term. If the parts can be repaired, they may be so treated; but if the decay or injury has gone so far as to render repairs insufficient to restore the usefulness of the part, it must be made good. Thus, among the items the tenant is called upon to make good is that of roofing; such as to replace all loose and broken tiles, to strip and retile where the laths are broken, or where the rafters, feet or purlins are decayed; to restore all defective filleting and pointing. Defective brickwork in walls, chimney-shafts, parapets and gables; portions out of the perpendicular, or bulged or cracked, have to be made good, besides repointing where necessary, and refixing broken chimney-pots. Slated roofs also come under the same general clauses. Repairs to woodwork include such items as the following: making good to all loose or decayed timbers, whether injured by wet or dry-rot; to fix timbers where not straight, through neglect or decay; to secure and make good all loose, broken or decayed weather-boarding, frames, skylights, wooden gutters, dormer boarding, and other external work; also to make good broken or decayed wooden fences, door-frames, etc.; to secure and make good all loose, broken or rotten floors; to fix up and relay where not level, occasioned by neglect, and to rehang where required all doors and shutters; replace broken lines, repair sashes, nosings to stairs where defective, and treads. Questions are continually arising regarding the liability of the tenants to repair joiner's work, but it appears clear that the burden of repairs falls upon the tenant. With respect to mason's work, all defective stonework, of whatever description, falls upon him. Thus, broken cornices, lintels and sills have to be made good by filling-in pieces; also broken steps and landings, both inside and out. In case of broken nosings, or of treads so worn down as to become dangerous, "the piecing is to extend to cutting out the upper surface and filling in the depth of nosing with a slab of sufficient thickness to form a new nosing. Broken chimney-pieces, slabs and inner hearths to be made good or be relaid; and loose and sunken pavings to be taken up and relaid. All panes of glass having two cracks in them to be reinstated, and also the making good of all putty work. With respect of painting, it is usual for the tenant to repaint all wood and iron work for their preservation, and where defaced, also on stone, stucco, or other external work. Inside painting is exempted, except in cases of misuse. To other trades the same rules apply; all broken fittings, fixtures, and parts of buildings to be repaired or made good by the tenant. The term "to make good" implies a renewal of the part, and ought not to be confused with the general words "to repair." — *The Building News.*

New York's Tenement-Houses. — Inspector Frederick N. Owen, who has spent three months in examining the tenement-houses of this city, made his report to the tenement-house commission lately. He found the following percentage of sanitary conditions: —

	Building.	Plumbing.	Tenants.
Good	35.47	2.08	36.87
Fair	46.78	58.83	54.26
Bad	17.73	39.37	9.16

This shows that the tenants, as a class, are slightly in advance of the buildings they occupy, and upsets the theory that the tenants make the buildings shabby. In point of cleanliness, the inspector places the Germans first, and the French, English, Irish, Polish Jews and Italians in the order named.

ARCHITECTURE AT CINCINNATI.



Panel in the Monmouth Battle Monument: N. J. Subject: "Molly Pitcher" — designed by J. E. Kelly. NY

THE year 1884 has stepped back into the past in a decent and orderly manner, and has left us its history to contemplate, and from its long architectural procession as it marches by us in memory we gather bits and fragments that shall be unto us a lasting benefit in the years to come; and it is well to stop at these yearly mile-stones to contemplate the progress made, the work accomplished, the good done; and while we look on with feelings akin to satisfaction and contentment; yet nothing has been erected that might not have been better, for whenever the time comes that architectural perfection is reached it will then be time to close up the architectural world, and pass judgment on the quick and the dead.

In a jaunt about the city, with feelings somewhat as expressed, one will come first and foremost to the Government Building on Fifth Street, from Walnut to Main, occupying half a block. Like the poor, this building is always with us, and like the poor, also, it furnishes items of interest. We find that the building is actually and finally enclosed, that the finished floors are being laid, that some of the inside finish is being manufactured and put in place, that the glass ($23,000 worth) has been contracted for, that the plastering for the most part has been, or is being done, and altogether that in the course of human events it will certainly be finished. The slow progress that this building has made, may be accounted for somewhat by the fact that during the summer months when work might be done, the appropriations have been exhausted, and during the winter months, when they have the appropriations, everything is frozen up, and they can't work. This building is now, and ever has been (since it started some twelve years ago) in charge of Mr. Samuel Hannaford as Superintendent.

Leaving the Government Building for another year, we go down Walnut to Fourth Street, and behold the highest building that has yet been erected in the city; it is 66 feet front, *ten stories high*, and was designed for the Emerys, by Mr. Hannaford; its height is perhaps its chief glory, and after looking at it for awhile, one will say, "Well, that's not bad," and pass on westwardly on Fourth Street, half a block to another street-front by Mr. Hannaford, for Messrs. John Church & Co., which is about 60 feet front, and only five stories high, and therefore only half as interesting as the Emery Block. Both these buildings are faced with Ohio freestone, of which this city is chiefly built. Farther down Fourth Street, corner of Elm, Mr. Hannaford is erecting for Mr. W. H. Derby, a store and office-building, but as it is only up to the street-line, you can contemplate nothing but its futurity, as represented by piles of brick, lumber, stone, etc. Here, however, the architect has a larger lot (and a corner one at that), and we shall look for greater things from him, because of greater opportunities.

The year will perhaps be easily remembered architecturally, on account of the Court-House and the Art Museum, both in charge of Mr. James W. McLaughlin, Architect. The Court-House was destroyed by riot and fire last March, and we find that the old walls (except the outside ones on the north, south, and east), have been torn down and the débris cleared away, and that work of rebuilding has already been commenced; that the drawings have all been finished in an incredibly short space of time, and contracts for the enclosing of the building have all been advertised for, and let according to the law in such cases made and provided. It is seldom, indeed, that a job of this magnitude has progressed so rapidly, smoothly, and satisfactorily. The front of the new building (and it really has only one front), has been designed by Mr. McLaughlin, more in the Norman or Romanesque than anything else, and will be entirely different from the old one, which was strictly Corinthian, even if the modillions of the cornice were of cast-iron, painted like stone; but for that matter the entire building, stone and all, had the year before all been nicely and newly painted white.

The Art Museum, located on one of the hills in Eden Park, presents a solid and sedate appearance: it is built of local blue limestone, and trimmed with red granite; the walls seem to be all finished ready for the roof. This building has also progressed rapidly and well.

Messrs. Mabley & Carew are to build corner of Fifth and Vine Streets, a new store 66 feet on Fifth, and 90 feet on Vine Street, five stories high, freestone fronts, tower on the corner, Edwin Anderson, architect; cost not stated. Other than the foregoing, we hear of nothing in the way of large improvements, but there seems to be plenty of the smaller kind.

Having mentioned the principal buildings, it is too much of a task to enter the smaller ones, except to mention, *en passant*, that at least six new churches are now underway, and most of them have been designed by Mr. A. C. Nash.

Leaving the past and looking unto the future, we find a promise of interest in the competition for the new Chamber of Commerce Building, which is to be erected at the corner of Fourth and Vine Streets. The lot is 100′ x 150′, and is certainly a fine one, although not quite large enough, the money ($500,000) is ample, and the selected architects the best the country affords; and they are to be paid $500 each, whether or no their designs are accepted, and the successful one of course gets the usual commission. Besides the six invited, the field is open to all, only they don't get paid unless their pole is long enough to knock the persimmon. Whether this programme will be carried out or not remains to be seen, but we hope it will be, as it will afford us the only genuine competition ever had in this city. One peculiar feature of the competition is that, although the designs of one of the six invited architects may be placed as "most meritorious," yet the committee do not bind themselves to employ him as their architect, even to prepare the plans, but will pay $2,000 to him, and have the right to employ an architect of their own choosing to perfect the plans.

Of the total amount of building done last year it is as usual hard to estimate, as we have no reliable records kept; since a permit is only taken out when the street is to be occupied, and then the cost can be put at almost any figure. But the records from year to year, however, just as they appear on the books of the Board of Public Works, form a very good basis of comparison; and so we give the figures for what they are worth, with the advice to multiply by two in each case.

Year.	Permits.	Cost.
1880	636	$1,521,700
1881	569	1,832,600
1882	660	1,952,300
1883	773	2,670,900
1884	747	2,958,000

C. C.

THE OWNERSHIP OF DRAWINGS.

MACON, GA., January 6, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — The question of ownership of designs, plans and specifications is one constantly arising in our practice. In your last issue appears a copy of the schedule for professional service adopted by the American Institute of Architects, and they declare that "Drawings and specifications as instruments of service are the property of the architect." Our clients and the public demur, and say the above is a rule of the Institute, and not *law*. If this question has been decided by the courts, will you kindly inform your readers where the decisions can be found?

I am, very truly, ARCHITECT.

[THE precedent on this point is the famous case of the British Government against the heirs of Sir Charles Barry, to recover the plans of the Parliament Houses at Westminster. This was decided in favor of the Government, although, as architects throughout the world claim, unjustly, and in violation of the understanding implied in the contract between Sir Charles and the Government. However, as courts are likely to follow this decision, the only way to make sure of retaining property in the plans is to have an express understanding with the client beforehand. — EDS. AMERICAN ARCHITECT.]

THE ECCLESIASTICAL BONFIRE.

BOSTON, January 10, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,—The interesting design of a proposed church in Paterson, N. J., again suggests the question: Will it constitute another example of a stone screen protecting an inside timber church, so constructed as to assure a total loss from the smallest fire in the cellar?

In the practice of combustible architecture great progress seems to have been made. The rate of destruction of churches is now nearly *two* per week, a gain of one per week in seven years. Hospitals, asylums and almshouses are now being destroyed at the rate of one every two weeks, against one per month a little while ago.

Could you not give some inside plans and specifications for incombustible churches?

Yours truly, E. A.

POSTAGE RATES ON DRAWINGS.

CLEVELAND, O., January 12, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,— I received a letter from the First Assistant Postmaster-General, containing the following, which may be of interest to some of your readers, as I think there is still a misunderstanding in regard to the law on first and fourth class matter, and the distinction between various classes of architectural plans: —

"Drawings, plans and designs, when *entirely* in *print*, are only subject to third-class rates of postage. Such printed plans or drawings, when they contain additional matter supplied by hand, as the addition of lines, figures or words, become subject to letter-rates of postage. Photographs have been held to be subject to fourth-class rates of postage. Blue-prints are classed with photographs."

Yours truly, GEORGE F. HAMMOND.

NOTES AND CLIPPINGS.

Death of an Architectural Painter. — The sudden death is announced at Brussels, on December 7, of M. Jean-Baptiste van Moers, the well-known architectural painter. He was but fifty-eight years of age, and fell dead while working at his easel, palette and brushes in hand. His views of old Brussels that decorate the Salle d' Attente, in the Hôtel de Ville, were painted before the boulevards, etc., had improved away portions of the picturesque lower town. His latest work, in which he is said to have surpassed himself, was the decoration, with views of Venice, of a dining-room for his friend, the animal painter, M. De Haas.—*Academy, December* 20, 1884.

History of Greenough's Washington. — For the past forty years and more, people have laughed at the cold air and naked form of George Washington, as he sits in marble at the east front of the Capitol. He has been the butt of all the jokes of senators, representatives, strangers and guides, for the past four decades, and even solemn Allen G. Thurman has aided in the ridicule. Still this statue has a longer history than any other at the Capitol. It was ordered by Congress at the end of Andrew Jackson's first term, and it took eight years for Horatio Greenough to make it. He did the work in Florence, Italy, and he made the statue in a sitting posture instead of pedestrian, as the Act of Congress demanded. It was designed, you know, to stand in the centre of the rotunda inside the Capitol. Well, when it was completed, in 1840, the next question was how to get it from Italy to America. Congress haggled over it for some time, and finally sent a man-of-war to bring it from Genoa to Washington. In the meanwhile Mr. Greenough had started it on to Genoa. It weighed twelve tons, and it took twenty-two yoke of oxen to haul it. As it went on its way through Italy, it is said that the peasants thought it the image of some saint, and that here and there they knelt and crossed their breasts as it went by. When it got to Genoa it was found that it was so large that it could not be gotten through the hatchway of the man-of-war which was to carry it to Washington, and a merchant vessel had to be chartered. At last it arrived at the Washington Navy-Yard, and Congress was horrified to see that their pedestrian statue was sitting in a chair, and that it was nude to the waist. Henry A. Wise then said: "The man does not live, and never did live, who saw Washington without his shirt," and the country applauded the sentiment. But the navy-yard is not the Capitol, and it cost five thousand dollars to bring the statue from it to the rotunda. When it was gotten to the Capitol doors it was found that the statue, like the painting of the Vicar of Wakefield's family, was too large to go through. The masonry had to be cut away and the door enlarged. When it was finally put in, it is said the floor began to sink and a pedestal had to be built under it to support it. It was soon found, however, that the rotunda was no place for it, and finally, after a number of removals, it was taken to where it now stands in the bitter cold, bleak air of the Capitol plateau, where the winds can howl out Washington's agony as they go tearing by, and where his nakedness has "the boundless arch of the sky" for a canopy. Originally the statue was to have cost $5,000. It has already cost $44,000, and this sum is considerably increased at every removal. — *Washington Correspondence of the Cleveland (O.) Leader.*

The Excavation of the Roman Forum.—A correspondent of the *London Times*, writing from Rome, says: "The *France* informs the Parisian public that the pope has conferred upon the new Cardinal Ganglbaur, Archbishop of Vienna, the title of Santa Maria Liberatrice, in order to prevent that church, which stands between the Palace of Caligula and the Forum, from being thrown down in the course of the excavations; and the *Diritto*, remarking on the above, indignantly expresses its surprise at the Archæological Commission and the Ministry of Public Instruction, for showing so much homage to the Vatican as to permit that obstacle to the completion of the excavation of the Forum to remain standing, especially as it is devoid of the slightest architectural or artistic merit. The *France* deserves thanks for having aroused the Roman press to urge the demolition of the church of Santa Maria Liberatrice. Being, as it is, an obstacle to the progress of the excavations, and possessing neither a living congregration nor any past historical associations, it certainly ought not to be permitted to stand, in homage either to the Vatican or anything else. But it is untrue that the pope has sought to preserve the church by giving it to Cardinal Ganglbaur, for two sufficient reasons: first, that it is not and never has been on the list of the titular churches; and secondly, because a cardinal's title is only conferred upon him at the time when the pope, in public consistory, places the traditional red hat on his head. For that Cardinal Ganglbaur must come to Rome, and as he may not do so for months, the question which of the vacant churches shall be conferred upon him will only then, as usual, be taken into consideration. It is not the pope, but those estimable and wealthy ladies, Oblates, who have succeeded the vestal virgins as owners of the property at that corner of the Palatine, who stand in the way of the excavations. They have no objection to sell the church; but the price they ask for it is enormous, and although they have come down somewhat in their pretensions, the lowest sum they have yet named is half a million. In the meantime the works are to be continued by the demolition of the modern granaries, built among and against and almost hiding those magnificent, lofty walls behind the church of Santa Maria Liberatrice, belonging to a grand edifice at the base of the Palatine, regarding which nothing whatever is known, though many different names have been given to it. The clearance at this point will solve a most interesting problem, and doubtless have very important results. As the opening of the new Via Cavour continues towards the Forum, the modern houses between the Curia and the temple of Antoninus and Faustina, which still cover the remains of the Basilica Emilia and other edifices on that side of the Forum, will be removed and the excavations there carried to completion. Some little time, however, must elapse before this can be done, and altogether the actual condition of Italian finances, and the greatly increased burdens which the cholera and other disasters have brought upon the country, leave little hope of much progress being made in antiquarian research this winter"

Seville Cathedral's History.—A correspondent of the Cincinnati *Enquirer* says: There is something singularly attractive about all these old cathedrals — in their age, their history and constant use throughout, whatever change of dynasty or form of religion the place containing it must undergo. Perhaps this change has been exemplified nowhere else more markedly than at Seville, for Seville has rung the changes in forms of government and difference of rule almost as much as Rome. Seville was an old city in the times of Strabo, Pliny and Ptolemy, and the discussion, active then, still continues as to whether Seville was founded by Hercules or Bacchus, or in epochs less mythologic, by the Chaldeans, Phœnicians or the Jews. Up to the year 711, Seville was under the Gothic rule. Then it was that the Moors seized it, and the Sultan of Cordova put over it a governor of his own. In 1144 the Sevillians became so proud as to wish for a king of their own, and the simple mode of making a monarchy of Seville was to put a crown upon the head of their own Viceroy. But the Sultan of Cordova did not take kindly to this deed, so he sent down an army to recapture Seville, whereby he lost his own crown, and Seville took possession of Cordova. In 1236, Ferdinand II, king of Castile and Leon, seized Cordova for himself, and Seville now declared herself a republic. Twelve years later Ferdinand II seized Seville for himself, and incorporated it in the rapidly-growing kingdom of Castile. Thus has Seville become in the space of five hundred years a colony of Rome, a dominion of the Goths, a kalifate of the Sultan of Cordova, an independent capital of the Moors, a republic, and a subject of the kingdom of Castile. On the same spot of ground now occupied by the ancient cathedral of Seville, worship has been offered up through all this time, each religion, though thoroughly despising, never ceasing to use the temples of its predecessors. A Jewish synagogue, a temple of Venus, a temple of Jupiter, a Mohammedan mosque, and a Catholic cathedral have all occupied this ground, each after its proper purification from the foul contamination of the rest. So to the stranger, of whatever faith, or of no faith at all, this cathedral of Seville stands on hallowed ground. All around it in rows are old columns of stone, partly sound, in places broken off irregularly above, relics of forgotten structures, else all effaced. And as we look upon the crumbling walls of the present temple itself, the thought will not be suppressed: What will be the new religion to succeed all this? Will it be the faith of the great reformer, which has spread like the flash of fire over so many of the lands of highest civilization, or will it be the faith of the reason which believes nothing not demonstrable to the senses, and which is gradually undermining all faith in the great intellectual centres of the earth? Will this old cathedral, consecrated to the worship of the one God, built upon the ground where once was a temple to the glorification of many gods, will it give way in its time to halls of science, wherein will be expounded the laws of simple Nature, which Jews, Goths and Moors, as well as Christians, must like obey? *Quien sabe?* But not in our day; certainly not here. Certainly not here in Spain, last of all.

The Proposed Saharan Sea.—With reference to the daring French project for flooding the desert of Sahara with what would be virtually a new sea, it may be well to recall the opinion expressed by M. Elisée Réclus that at one period in the world's history the desert was covered by a sea very similar to the Mediterranean, and that this sea exercised a very great influence upon the temperature of France, as comparatively cold, or at any rate cool winds blew over it, while now the winds which prevail in the great expanse are of a much higher temperature, and are, in fact, sometimes suffocatingly hot. The appearance of the desert seems to support the theory of M. Elisée Réclus, that it was at one time the bed of a sea of considerable extent, of which the great inland African lakes recently discovered are possibly the remains. The present vast extent and configuration of the African continent would also appear to support the conclusion that at one time it comprised a less area of land than it does at present. The serious question which arises, assuming that the theory of M Elisée Réclus is substantially correct, is, what will be the effect of the creation of a second African sea in the room of that which has disappeared? Would the temperature of France, and possibly even of England, be again reduced? It is a geological theory that, in the glacial period of the world's history, Great Britain was covered with ice and snow, very much as Greenland is at present. Some great influence must clearly have been brought to bear upon France and Great Britain, which rolled the ice over so many hundred miles northward. What was this influence? Was it the large African sea which French enterprise is endeavoring to recreate? If it were, we should say that whatever the French may gain in Africa by the realization of a Saharan sea would be much more than counterbalanced by what they would lose in France itself.—*Engineering.*

The "Ubanizing" of England. — Apart from the political effects, to which it is not our province to refer, of the new electoral division of the country, it may be regarded as a step toward what may be called the urbanizing of England. The rapidly-increasing pressure of population on area must, if continued long enough, in time convert a populous island into a group of towns. But the rate of agglomeration varies very much. Towns with fewer than 10,000 inhabitants, as a rule, are now hardly increasing in population; some of them are actually decreasing, as are some rural districts. As a general rule the outer ring of the metropolis, and the towns of between 100,000 and 200,000 inhabitants, are most rapidly increasing. Most marked of all is the increase of certain seaport and waterside towns. In twenty-five towns classed as seaports, the increase of houses from 1871 to 1881 was 16.6 per cent; in Great Grimsby it was 71 per cent; and in Barrow-in-Furness 148 per cent in the decade. This determination of the population toward certain centres of activity is a matter of primary importance as regards the building industry of the country, with a general increment which would double the population enumerated in 1881 by the year 1936. The actual rate of urban increase in the number of inhabited houses was 15.6 per cent in ten years, against a rural increase of 11.0 per cent, and in the sixteen towns with populations between 100,000 and 200,000 each, which contain in all 408,000 houses, the increase in the decade has been on the average 21 5 per cent. The town builders are thus those whose activity is most apparent.—*London Builder.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents herementioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

309,998. BENCH-HOOK. — Charles M. Van Vleck, Uhrichsville, O.
310,014. FIRE-ESCAPE. — Chas. B. Anderson, Maysville, Ky.
310,033. ADJUSTABLE BUTT-HINGE.— Robert G. S. Collamore, Boston, Mass.
310,046. SPIRIT-LEVEL.—Albert D. Goodell, Miller's Falls, Mass.
310,048. SPIRIT-LEVEL. — William Grams, Sturgis, Dak.
310,076. HINGE FOR AWNING-BLINDS.— Patrick K. O'Lally, Boston, Mass.
310,079. VENTILATION OF SOIL AND WASTE PIPES. —Papheo D. Pine, Worcester, Mass.
310,084. LOCK. — George W. Roberts, Walla Walla, Wash.
310,087. FIRE-ESCAPE.—Clark R. Shelton, New Haven, Conn.
310,088. BRICK.— Arthur Sherry, Learned Station, Miss.
310,100. JACK-SCREW.—Walter W. Vaughn, Stockton, Cal.
310,116. HOT-AIR REGISTER. — John F. Beale, Washington, D. C.
310,154. SPIRIT-LEVEL. — Benjamin F. Tyler, Salem, N. J.
310,156. SMOKE-CONSUMER. — William Vogel, Chicago, Ill.
310,157. FILTER. — Andrew von Weisenflue, Scranton, Pa.
310,163. PLANE.—William F. Achenbach, Reading, Pa.
310,179. DOOR-CLOSER. — Edward H. Brown, New York, N. Y.
310,183. ELEVATOR. — Philip F. Corbett, Boston, Mass.
310,192. FIBROUS-PULP ROOFING-TILE.— Julius T. Edson, Cleveland, O.
310,205. FABRIC FOR COVERING HEATED SURFACES.—Henry W. Johns, New York, N. Y.
310,212. AIR-REFRIGERATING APPARATUS.—Chas. P. Marshall, Memphis, Tenn.
310,218. LADDER. —Joseph D. Norton and Leonard M. Norton, West Hampton, Mass.
310,220. SASH-HOLDER. — Chas. A. Paul, Mill Centre, Wis.
310,229. DOOR-HANGER. — Obadiah Seeley, Syracuse, N. Y.
310,232. LUMBER-STACKER. — William T. Smith, Bozeman, Ala.
310,242. BURGLAR-ALARM. — James G. Battersen, Hartford, Conn.
310,277. OPEN FIRE-PLACE.—Isaac Hayes, Philadelphia, Pa.
310,292. CALIPERS. — Frank G. Lilja, Springfield, Mass.
310,298. SEWER-CONNECTION FOR WATER-CLOSETS.—Samuel G. MacFarland, New York, N. Y.
310,300. PIPE-COUPLING. — William R. Middleton, Cleveland, O.
310,312. WINDOW-SCREEN. — Josiah K. Proctor, Philadelphia, Pa.
310,320. SPRING-LOCK FOR HATCHWAYS.—William J. Ritchey, Pittsburg, Pa.
310,341. WELL-CURB.—Miciah Walker, Port Huron, Mich.
310,344. BATH-TUB. —Alexander M. Waterworth, Baltimore, Md.
310,349. CHAMFERING-PLANE.—Richard V. Wicks, Brooklyn, N. Y.
310,352. TRANSOM-LIFTER. — John F. Wollensak, Chicago, Ill.
310,355. WINDOW. — Robert Adams, 17 Blackman Street Borough, County of Surrey, England.
310,364. WEATHER-STRIP. — Charles A. Binkly, Troy, O.
310,372. SHUTTER-WORKER. — Robert I. Brown, New York, N. Y.
310,375. STEAM-RADIATOR. — William G. Cannon, London Road, Southwark, County of Surrey, Eng.
310,377. MOULD AND MOULD-HOISTING APPARATUS FOR BUILDING CONCRETE WALLS.—Thomas W. Carrico, San Antonio, Tex.
310,381. MARQUETRY. — Amand J. B. A. Chatain, New York, N. Y.
310,391. CHIMNEY-CAP.— Henry S. Dickinson, Jersey City, N. J.
310,401. WATER-CLOSET SEAT.—Melchor Fox, Eau Claire, Wis.
310,404. FIRE-EXTINGUISHING COMPOUND.—Ferdinand Frolich, New York, N. Y.
310,406. WEATHER-STRIP. — Stephen J. Gard and Jaroslav Zaruba, Goshen, Io.
310,409. SPRING-HINGE. — William Gilfillan, New Haven, Conn.
310,421. BURGLAR-ALARM. — Horace T. Helmbold, Philadelphia, Pa.
310,432. AUTOMATIC FIRE-EXTINGUISHER. — Chas. L. Horack, Brooklyn, N. Y.
310,437. GRATE-FRONT.—E. A. Jackson, New York, N. Y.
310,445. HEATING APPARATUS.—Eduard Kraschovitz, Reudnitz, near Leipsic, Germany.
310,450. DRAUGHTSMAN'S DIVIDING-INSTRUMENT. —Phœbe S. Marks, 131 Cornwall Residences, Regent's Park, St. Marylebone, County of Middlesex, Eng.
310,473. BENCH-PLANE. — Wm. Steers, Brattleborough, Vt.
310,481. EASEL.—Thomas C. Vail, Topeka, Kans.
310,514. GRATE.—John W. Houston, Bellaire, O.
310,529. FLUSHING-SIPHON. — Harvey C. Lowrie, Denver City, Col.

SUMMARY OF THE WEEK.

Baltimore.

DWELLINGS. — W. L. Stork, Esq., is to have erected twenty-two (22) three-st'y and mansard marble and brown-stone dwells., near Boundary Ave., com. cor. Bolton St., 16′ 6″ x 65′ and 18′ x 65′, and 20′ x 65′, to cost about $110,000; from designs by Wm. F. Weber, architect.

BUILDING PERMITS. — Since our last report nine permits have been granted, the more important of which are the following: —

E. W. Haviland, 6 two-st'y brick buildings, e s Stockton Alley, n of Mosher St.

Morgan & Bro., 12 two-st'y brick buildings, e s Hanover St., n of Cross St.

Frank Gunterman, three-st'y brick buildings, s e Henrietta St., bet. Sharp St. and Peach Alley.

Boston.

BUILDING PERMITS. — *Shawmut Ave., No.* 771, dwell., 20′ x 40′; C. W. Geiler, owner.

Richfield St., near Columbia St., dwell., 22′ x 30′; N. M. Robbins, owner and builder.

Dudley St., No. 434, wooden storage, 12′ x 25′; Ed. H. Rice, owner; Michael Quinn, builder.

Washington St., near Keyes St., wooden dwell., 21′ x 36′; Hannah Kennedy, owner; Michael Kennedy, builder.

Falcon St., near Putnam St., wooden stable, 20′ x 25′; Mary A. F. Lambert, owner.

Savin St., near Warren St., wooden dwell., 24′ x 30′; Lorenzo Base, owner.

Centre St., near Pynchon St., wooden store, 20′ x 24′; H. B. Grant & M. Sargent, owners; Richardson & Young, builders.

Granite St., near Mt. Washington Ave., wooden storage of scenery, 50′ x 100′; Boston Manufacturing Corporation, owners; N. S. Wilbur, builder.

Swett St., opposite Magazine St., wooden storage, 90′ x 256′; Bradley Fertilizing Co., owner; C. Feldon, Jr., builder.

North First St., No. 168, wooden storage, 40′ x 44′; Asa P. Moore, owner; Michael Driscoll, builder.

Brooks St., No. 3, wooden mechanical building, 15′ x 30′; John D. Finn, owner; G. G. White, builder.

Ashland St., wooden church, 43′ x 71′; Rosendale Baptist Church Society, owners; Alex. Rogers, builder.

Florence St., wooden church, 43′ x 71′; Rosendale Baptist Church Society, owner; Alex. Rogers, builder.

South St., wooden stable, 30′ x 80′; C. W. Clapp & Co., owners.

North Second St., No. 186, wooden stable, 30′ x 80′; S. Pinnell, owner.

Ashley Ave., No. 28, wooden store and stable, 18′ x 22′; G. B. Green, owner and builder.

Cottage St., wooden shed, 22′ x 50′; Lewis S. Andrews, owner; F. W. Webster, builder.

Holburn St., 2 wooden dwells., 36′ x 105′; Geldert & White, owners and builders.

Seaver St., No. 266, wooden wagon-shed, 16′ x 20′; Augustus Packer, owner.

Elm Hill Ave., wooden wagon-shed, 16′ x 20′; Augustus Packer, owner.

Blue Hill Ave., wooden dwell., 22′ x 30′; Patrick Daly, owner; J. H. Burt & Co., builders.

Purchase St., cor. Hartford St., brick mercantile-building, 14′ x 42′; L. A. Bullard, owner; Woodbury & Leighton, builders.

Taylor St., brick dry-house, 51′ x 112′; A. T. Stearns Lumber Co., owner; Collins & Morley, builders.

Green St., brick bowling-alley, 51′ x 166′; Patrick Mehan, owner; Daniel Cuvlin, builder.

Oliver St., brick restaurant, 16′ x 266′; L. M. Childs & A. D. McDougall, owners.

Taylor St., brick mechanical building, 29′ x 122′, A. T. Stearns Lumber Co., owners; Collins & Morley, builders.

Clarendon St., brick storage, 15′ x 15′; B. & P. R. R. Co., owner; G. F. Folsom, builder.

Newbury St., 2 brick dwells., 18′ x 22′; Silas W. Morrill, owner and builder.

Brooklyn.

BUILDING PERMITS. — *North Eighth St.*, s s, 150′ e Third St., four-st'y frame (brick-filled) tenement, tin roof; cost, $5,500; owner, John Starkey, 331 Fourth St.; architect, A. Herbert; builders, J. Starkey & Son.

Clay St., Nos. 42 *and* 44, s s, 325′ w Manhattan Ave., 2 three-st'y frame tenements, felt and gravel roofs; cost, $7,200 for both; owner, Thomas Thompson, 361 East Seventy-first St., New York; architect, James Denning; builders, James Nilen and John Costello.

Judge St., No. 10, e s, 110′ n Powers St., four-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,000; owner and builder, Henry Kinn, 8 Judge St.; architect, A. Herbert.

Monteith St., Nos. 53 *and* 55, n s, near Bremen St., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,200; owner, Henry Stubing, Monteith St.; builder, Henry Kempf.

North Eighth St., No. 443, n s, 200′ e Third St., four-st'y frame (brick-filled) tenement, tin roof; cost, $5,500; owner, Matthew Smith, on premises; architect, A. Herbert; builder, not selected.

North Ninth St, s s, 150′ w Fifth St., four-st'y frame (brick-filled) tenement, tin roof; cost, $5,600; owner, P. Booden, North Ninth St.; architect, A. Herbert.

Steuben St., w s, 90′ s Park Ave., 3 three-st'y tenements, tin roofs; cost for all, $9,000; owner, James Cary; builders, Long & Barnes.

Steuben St., w s 90′ s Park Ave., 3 three-st'y brick tenements, tin roofs, wooden cornices; cost, each, $5,000; owner, James Carey, cor. Clermont and Willoughby Aves.; builders, P. J. Carlin and Long & Barnes.

Fourteenth St., s s, 247′ 10′ w Sixth Ave., 3 two-st'y brick dwells., tin roofs, wooden cornices; cost, each, $2,500; owner and builder, Geo. R. Waldron, 529 Halsey St.; architect, Amzi Hill.

Penn St., s s, 100′ w Broadway, one-st'y brick Municipal Electric Light Co. plant, iron roof; cost, $8,000; owner, Municipal Electric Light Co., 104 Broadway; architect, E. F. Gaylor; builder, James Haughan.

ALTERATIONS. — *Scholes St.*, n s, 75′ w Graham Ave., two-st'y frame extension, tin roof, also beams put in first st'y and entire building filled in with brick; cost, $2,500; owner, Th. Kayser, Graham Ave., near Scholes St.; architect, John Platte; builder, Ulrich Maurer.

Nevins St., s w cor. Baltic St., raise roof 5′; also, one-st'y frame extension, gravel roof; cost, $3,000; owner, John S. Loomis, cor. Nevins and Baltic Sts.; architect and builder, John P. Free.

South Portland Ave., No. 52, first flight stairs rebuilt and house retrimmed; cost, $6,000; owner, A. A. Peck, Liberty St., n w Nassau St., New York; architect, R. H. Rowden; builders, Jeans & Taylor.

Chicago.

THE YEAR'S WORK.—Commissioner Kirkland reports 3498 permits issued for the year ending December 31, 1884; number of buildings, 4169, with 98,782 feet frontage; cost, $20,857,300, requiring an estimated outlay of $26,071,625.

The increase for the year over that of 1883 numbers 294 permits, 83 buildings, and an increased cost of $3,909,015. The large difference in cost is accounted for by the unusually large number of office-buildings and other expensive structures.

Among the more important buildings are the following: —

Armour, Kent & Bensley, office-building; cost, $1,000,000.
Home Insurance Co., office-building; cost, $390,000.
J. M. Loomis, office-building; cost, $300,000.
Chicago Opera-house Co., opera-house; cost, $500,000.
Marshall Field, office-building; cost, $400,000.
John Q. Adams, office-building; cost, $135,000.
P. C. & S. L. Brooks, office-building; cost, $250,000.
W. D. Kerfoot & Co., office-building; cost, $80,000.
Western Theological Seminary; cost, $75,000.
Chicago Gas-Light Co., tank; cost, $50,000.
J. K. Fisher, building; cost, $50,000.
F. A. Kennedy & Co., bakery; cost, $50,000.
Heissler & Gung, bakery; cost, $60,000.
Gottfried Brewing Co., brewery; cost, $100,000.
H. Beidler, factory; cost, $60,000.
Washington Bou. Skating Rink Co.; cost, $50,000.
A. F. Troescher, warehouse; cost, $70,000.
M. Ryerson, warehouse; cost, $50,000.
Mrs. McCormick, warehouse; cost, $75,000.
Thos. Moran, flats; cost, $60,000.
F. C. Porter, flats; cost, $60,000.
C. B. Blair, store; cost, $100,000.
New England Insurance Co., store; cost, $55,000.
J. P. Atwater, stores; cost, $50,000.
P. Hoenschofen, stores; cost, $50,000.
Conrad Seipp, stores; cost, $50,000.
Armour, Dole & Co., building; cost, $80,000.
H. B. Foss, dwells.; cost, $60,000.
U. P. Smith, dwells.; cost, $80,000.
J. Beecher, dwells.; cost, $50,000.
Board of Education, school-house; cost, $75,000.
Board of Education, school-house; cost, $50,000.

BUILDING PERMITS.—Board of Education, three-st'y school-house, 2527-2545 Lime St.; cost, $40,000; architect, J. J. Flanders; builder, D. H. Wilkie.

Baird & Bradley, 2 three-st'y dwells., 1507 and 1507½ Michigan Ave.; cost, $15,000; architect, H. L. Gay; builder, D. H. Wilkie.

D. R. Fraser, 2 two-st'y dwells., 390 and 392 Warren Ave.; cost, $9,000; architects, Cobb & Frost; builders, Angus & Gindele.

D. McGowan, two-st'y dwell., 71 North Leavitt St.; cost, $3,000; architect, Wm. Strippelman.

P. C. Brooks, twelve-st'y office-building, 282-288 Clark St.; cost, $220,000; architects, Burnham & Root.

Thos. Carey, two-st'y dwell., 263 Webster Ave.; cost, $3,000.

Western Art Association, panorama-building, 127-131 Michigan Ave.; cost, $28,000; architect, J. M. Carreere; builder, J. W. Garvey.

A. Geiss, four-st'y factory and dwell., 96 Wendell St.; cost, $10,000.

Fred. Rose, store and dwell., 951 West Madison St.; cost, $4,400.

Detroit.

BUILDING PERMITS. — R. Nelson, 2 brick houses, Fourth St.; cost, $5,500.

W. B. Wesson, brick hotel, Woodbridge St.; cost, $13,000.

C. C. Hodges, residence, cor. Woodward and Bradshaw Aves.; cost, $7,200.

D. Brooks, brick mill, cor. Warren Ave. and Fifteenth St.; cost, $6,000.

John Waterfall, brick house, No. 507 Cass Ave.; Ave.; cost, $7,500.

N. Mitchell, five-st'y brick block, Woodbridge St.; cost, $20,000.

Donaldson & Meur, architects, brick building for American News Co.; cost, $25,000.

Brick residence for Mrs. Green, Joy St.; cost, $9,000.

Brick residence for T. A. Wadsworth, McDougall Ave.; cost, $7,000.

J. Waterfall & Son, 3 houses, Cass Ave.; cost, $20,000.

Mrs. Jacober, 2 brick stores, Gratiot Ave.; cost, $5,000.

Mrs. N. Williams, brick house, Larned St.; cost, $5,000.

Schmidt & Co., block two-st'y brick dwells., Eighth St.; cost, $12,000.

Mrs. Dudley, 2 brick houses, Second St.; cost, $11,000.

Thomas Manning, brick house, Miami Ave.; cost, $6,000.

John Edwards, brick house, Elliott St.; cost, $7,-500.

John Edwards, 3 brick houses, Nos. 46-48 and 50 High St.; cost, $17,000.

No new buildings of any importance being projected at present. Building operations unusually dull this fall.

New York.

OUTLOOK. — Prospects are very problematical, little actual work is on the architects' board, but a good many alterations are projected.

PARTNERSHIP. — Mr. H. Edwards-Ficken has associated with himself Mr. Edward H. Clark, late with McKim, Mead & White. The firm address being H. Edwards-Ficken & Edward H. Clark, Architects, Office No. 19 West Twenty-second St., N. Y. Mr. Clark used to be in charge in Mr. McKim's.

STORE. — On Chambers and Rose Sts., a six-st'y building, with a frontage of 118' on Chamber St., and 78' on Rose St., is to be built for occupancy by the Mutual News Co.; from plans of Mr. Thos. R. Jackson, Mr. Michael Giblin.

HOUSES. — On the n s of One Hundred and Twenty-Third St., w of Mount Morris Ave., Mr. Anthony Smyth will have 3 three-st'y and basement brown-stone houses, 18' to 19' frontages, built from plans of Messrs. Cleverdon & Putzel, and from plans of same architects, Mr. T. O. Wright will have 4 three-st'y and basement brown-stone houses, 18' to 19' frontage, built on the n s of One Hundred and Thirtieth St., com. 225' w of Sixth Ave.

BUILDING PERMITS. — *Jerome Park*, 3 frame stables, wood roofing; cost, each, $1,500; owner, Jerome Park Villa Sites Improvement Co., W. R. Travers, president, 3 West Thirty-eighth St.; architect, W. H. Smith; builder, R. H. Casey.

West Eighty-third St., No. 371, five-st'y brick flat; tin roof; cost, $30,000; owner, Thomas Cochrane, 223 West Thirty-sixth St.; architect, J. Jardine.

Madison St., Nos. 313 *and* 315, 2 five-st'y brick and stone tenements, tin roof; cost, each, $15,000; owners, M. J. and D. F. Mahony, 52 New Bowery; architects, Babcock & McAvoy.

Elton Ave., e s, 150' n One Hundred and Sixty-first St., two-st'y frame dwell., tin roof; cost, $2,800; owner, Steven Garland, 759 East One Hundred and Sixty-third St.; architect, Samuel Garland; builder, John Y. Anderson.

Forsyth St., No. 152, five-st'y brick tenement and store, tin roof; cost, $15,000; owner, Henry Gottleib, 2 Second St.; architect, Julius Boekell.

Seventh Ave., s w cor. One Hundred and Thirty, fifth St., 8 three-st'y brick dwells., tin roofs; cost, each, $6,000; owner, Patrick J. O'Brien, One Hundred and Forty-third St., near Eighth Ave.; architect and builder, Richard R. Davis.

Third Ave., s e cor. One Hundredth St., 2 five-st'y brown-stone front tenements and stores, tin roofs; cost, each, $20,000 and $18,000; owner, P. H. McManus, 110 East Ninety-first St.; architect, John Brandt.

Twenty-sixth St., s s, 225' w Ninth Ave., 3 five-st'y brick tenements, tin roofs; cost, each, $18,000; owners, Watkins Bros., 304 East Forty-first St.; architect, F. T. Camp.

East One Hundred and Thirteenth St., five-st'y brick tenement and store, tin roof; owner, Bridget S. Sullivan, 412 East One Hundred and Thirteenth St.; architect, Andrew Spence.

West Twenty-ninth St., No. 221, five-st'y brick tenement, tin roof; cost, $9,000; owners, C. & J. O'Neil, 242 West Thirty-seventh St.; architect, John F. Wilson; builder, day's work.

Third Ave., w s, 125' 7" s One Hundred and Sixty-fifth St., four-st'y frame tenement and store, tin roof; owner, P. Garvin, 837 Cauldwell Ave.; architect, Aug. Schmidt.

First Ave., e s, 25' n Forty-fourth St., one-st'y brick Slaughter-House, tin or gravel roof; cost, $8,-000; owner, Marcus Fleischhauer, 348 East Fiftieth St.; architect, John McIntyre.

One Hundred and Thirty-third St., s s, 300 e Willis Ave., one-st'y frame dancing pavilion, tin roof, lessee, Aug. Baur, One Hundred and Thirty-second St. and Willis Ave.; architect, J. H. Valentine.

East Fifty-first St., No. 351, five-st'y brick tenement, tin roof; cost, $18,000; owner, Horace W. Fuller, 114 East Thirty-eighth St.; architect, W. R. Smith; builder, day's work.

East Eightieth St., Nos. 111, 113 *and* 115, 3 four-st'y brown-stone front dwells., metal roofs; cost, each, $13,000; owner and builder, James Brady, 109 East Eightieth St.; architects, N. Le Brun & Son.

ALTERATIONS. — *Walker St., Nos.* 72, 74, *and* 76, internal alterations, such as new stairs, new elevator, steam heating, etc., cost, $20,000; owner, Dr. Henry H. House, by his agents, Butler, Matthews & Co., 149 Broadway; architect, John McIntyre; builder, day's work.

Willoughby St., n w cor. Bridge St., put in a tier of iron beams and put on new roof, etc.; cost, $6,000; owner, Jacob Ruppert, on premises; architects, A. Pfund & Son.

Ninety-second St., n s, 85' w Second Ave., lower present roof and put on an additional roof, raise walls about three feet; cost, $3,000; owner, George Ehret, on premises; architect, A. Pfund & Son.

West Forty-second St., No. 115, one-st'y brick extension, tin roof; cost, $5,247; owner, R. S. Williams, 51 West One Hundred and Twenty-seventh St.; architect, J. F. Miller; builders, E. W. Gardiner and Thos. Wilson.

Third Ave., Nos. 1633 *and* 1635, put on a new roof, new iron beams, 5 new windows in wall; cost, $6,000; owner, Jacob Ruppert, 1639 Third Ave.; architects, A. Pfund & Son.

Third Ave., e s, 212' s One Hundred and Sixty-Ninth St., raise one-st'y rebuild south wall., etc., cost, $5,400; owner, David Mayer, 1304 Fifth Ave.; architects, Schwarzmann & Buchman; builders, List & Lennon.

East Forty-fourth St., Nos. 331 *and* 333, raise second st'y, new flat roof; cost, $3,500; owner, Frederick Oppermann, Jr., 154 East Forty-sixth St.; architect, Charles Stoll.

First St., Nos. 38-42, four-st'y and attic brick extension, tin and slate roofs; cost, $67,000; owner, City of New York, by Stephen A. Walker, president Board of Education, 8 East Thirtieth St.; architect, D. J. Stagg; builder, Joseph Spears.

Elizabeth St., s e cor. Hester St., repair damage by fire; cost, $4,500; owners, Simon Bing, Jr., 130 East Seventy-fourth St., and Jacob Bookman, 9 East Sixty-second St.; architect, Wm. Graul.

One Hundred and Twenty-seventh St., s s, 150' w Third Ave., three-st'y brick extension, tin roof; cost, $5,000; owner, Thos. W. Beacom, 610 East Eleventh St.; architect, Chas. Baxter.

Ninety-seventh St., Nos. 210, 212 *and* 274-294, build brick piers in cellars to support girders and repairs; cost, $5,000; owner, Washington Life Ins. Co., 21 Courtlandt St.

Water St., No. 61, repair damage by fire; cost, $4,-700; owner, John H. Caswell, exr., 11 West Forty-Eighth St.; builder, Lewis H. Williams.

Fifty-first St., Nos. 103 *and* 105, put in iron girders and posts in first st'y, etc.; cost, $3,000; owner, The F. & M. Schaefer Brewing Co., 112 East Fifty-first St.; architect, J. Kastner.

Broadway, No. 540, five-st'y and basement extension, metal roof; cost, $30,000; owner, Thos. Lewis, 582 Lexington Ave.; architect, John B. Snook; builder, not selected.

Fifth Ave., No. 254, lower floor take out partitions, new store front with iron girders, posts, etc.; cost, $5,000; owner, Julia M. Coggill, Richmond, Va.; architects, Berger & Baylies; builder, M. Magrath.

Philadelphia.

BUILDING PERMITS.—*Meehan St.*, between Musgrove and Chew Sts., 2 two-st'y dwells., 15' x 28'; Andrew Brachbold, contractor.

Waterloo St., No. 2312, two-st'y dwell., 18' x 37'; Wm. Kutz, contractor.

South Third St., Nos. 255 *and* 257, six-st'y factory, 40' x 181'; E. Cubberly, contractor.

Bouvier St., above Columbia Ave., three-st'y dwell., 14' x 48'; G. G. Gandy, contractor.

Tulip St., between Washington and Tyson Sts., frame church, 30' x 50'; Wm. W. Milner, contractor.

South St., No. 190, one-st'y building, 20' x 40'; Jas. G. Miller, owner.

Fifteenth St., e s, below Washington Ave., two-st'y box-factory, 36' x 40'; D. M. Hess, owner.

Columbia Ave., between Twenty-fifth and Twenty-sixth Sts., two-st'y stable, 16' x 40'; Michael Cooney, owner.

Juniper St., below Pine St., altering dwell. to stable, 16' x 85'; Gulbat & Keefer, contractors.

St. Louis.

BUILDING PERMITS. — Twenty-five permits have been issued since our last report, five of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows:—

Mary E. Kelly, two-st'y brick dwell.; cost, $2,500; contract sublet.

J. H. Wyth, two-st'y brick forge; cost, $2,500; A. J. Cramer, contractor.

Mrs. M. Curtis, two-st'y brick dwell.; cost, $5,500; J. W. Barnes & Co., contractors.

F. Fischer, two-st'y brick store and tenement; cost, $7,000; C. Schwartzkoph, contractor.

J. B. Cella, three-st'y store and offices; cost, $7,000; G. D. Fitzgibbons, contractor.

I. W. Morton, two-st'y brick dwell.; cost, $22,000; Peabody & Stearns, architects; Samuel Morrison, contractors.

Toledo.

THE past season has been a fairly good one for building interests in this locality. Quite a large number of moderate-priced buildings are in progress, operations being interrupted by decidedly wintry weather, which is upon us. Wages rule low. Many good mechanics are unable to obtain employment at any price. The tendency of prices for building materials is toward depression, and the outlook for the coming year is, that building will be cheap; too cheap, maybe, to indicate commercial health. There is, of course, a logical reason for the fact that the most building in our cities is projected and accomplished when labor and materials are held at high prices.

BUILDING PERMITS. — *Parkwood St.*, cor. Woodruff Ave., two-st'y and basement brick dwell., for Chas. F. Milburn; cost, about $6,500; N. B. Bacon, architect; Jas. Haies, builder.

Jefferson St., near Eleventh St., two-st'y brick dwell., for Thos. Dunlap; cost, about $4,000; A. Liebold, architect.

Ontario St., block of 3 two-st'y brick dwells., for Wm. C. Tate; cost, about $9,000; A. Liebold, architect; P. K. Tappan, builder.

St. Clair St., brick business block, 50' x 120', three stories high, for J. T. Newton; cost, about $14,000; J. E. Morehouse, architect; Schall & Costello, contractors of brickwork.

General Notes.

CLEVELAND, O. — Mr. Geo. F. Hammond, architect, late of Boston, has formed a co-partnership with Alexander Koehler, Esq., under the firm name of Koehler & Hammond, with offices in the City-Hall Building, Superior St.

CONNERSVILLE, IND.—Hodgson, Wallingford & Stem, Indianapolis, have residence for A. M. Andrews; cost, $3,000.

DESERONTO, ONTARIO. — F. S. Rathbun will commence a brick house soon, to cost $6,500, from plans by Palliser, Palliser & Co., architects, New York.

ELIZABETH, N. J.—The corner-stone of a high school building of brick, was laid December 10th, with appropriate ceremonies, W. H. Meeker, secretary, Board of Education; Palliser, Palliser & Co., architects, N. Y.

HADDONFIELD, N. J. — C. H. Mann, of Philadelphia, country house; cost, $7,500; Palliser, Palliser & Co., architects, New York.

NEWPORT, VT. — The citizens of Newport have guaranteed $5,000 for the new County Buildings to be built there.

ROCHESTER, N. Y. — Messrs. Walker & Nolan, architects, have prepared plans for a new chapel to be erected in the rear of St. Paul's Church. It will be a frame structure, with an auditorium 36' x 45'.

Plans for the new Government building have just been received from Washington. Bids will be received by Architect Ellis up to the middle of this month.

Plans are being prepared by resident architects for a new jail-building, to cost $60,000, and located on Exchange St.

ROCKVILLE, CONN.—Henry Adams is building a frame house; cost, $15,000.

Mr. Skinner is to build a frame residence, to cost $4,000, from plans by J. M. Currier, Springfield, Mass.

SHERRIL'S MOUNT, IO. — It is announced that a new Catholic Church is about to be erected at Sherril's Mount, a few miles north of Dubuque; to cost upward of $20,000.

STATEN ISLAND, N. Y. — Skating-rink, 250 feet long by 50' wide; also brick building, 50' x 50', two-st'y; club rooms, etc., for George Bechtel, Staten Island, to cost $50,000; plans and designs by I. M. Merrick, New York, N. Y.

Fire-proof building, 25' x 50', two-st'y; for county clerk, Richmond Co., N. Y.; I. M. Merrick, architect.

ST. PAUL, MINN. — F. L. Chapman, two-st'y frame dwell., n s of Holly St., bet. Dale and Kent Sts.; cost, $3,500.

A. J. D. Haupt, two-st'y frame dwell., n s of Portland St., bet. Grotto and Avon Sts.; cost, $2,600.

Episcopal Mission, two-st'y frame double dwell., e s of Rice St., bet. Summit and College Sts.; cost, $5,000.

WASHINGTON, D. C. — A two-st'y and basement brick and stone school-house, 50' x 60', is to be built for the Columbia Institution for the Deaf and Dumb, at a cost of about $20,000; from designs of the architect of the Institution, Mr. Fred. C. Withers, of New York.

WATCH HILL, R. I. — Five cottages are to be built here for Wayne Griswold, Esq., of New York City, to be occupied next summer; Palliser, Palliser & Co., architects, New York.

WATCHSHELL, R. I.—Miss Adams, of Baltimore, is to have erected a two-st'y frame artists' studio, 30' x 35', from designs by Messrs. Wyatt & Sperry, architects, Baltimore.

WATERBURY, CONN. — Dr. Alfred North, house on North Main St.; cost, $16,000.

W. E. Risley, cottage; cost, $5,500.

Mrs. Dr. Dougherty, house; cost, $6,000.

C. B. Webster, house; cost, $10,000.

Palliser, Palliser & Co., architects, Bridgeport, Conn.

WEIRS'S STATION, N. H.— The railway station at the Weirs is to have an addition of 100' two-st'y, the first floor to be finished off as a first-class restaurant; in the second story there will be offices and sleeping-rooms.

WESTTOWN, PA. — The Building Committee of the Westtown boarding-school of the Orthodox branch of the Society of Friends report that they have the sum of $192,000 subscribed of the $250,000, towards building the new school on their property in Westtown Township. The committee feel safe now to commence building, and the plans will be finally adopted in a few days. The structure will probably be of brick.

WORCESTER, MASS. — Worcester is suddenly thrown into a ferment because some of its leading citizens, notably Joseph H. Walker, have prepared a communication of a few lines to the City Council, asking for a new city hall, which shall cost not less than $300,000.

Ransom C. Taylor has bought the Front Street estate of the Osgood Bradley heirs, opposite the Common, and will improve it by the erection of a business block next season.

A new armory is to be built here, probably at the junction of Bridge, Mechanic and Foster Sts.

WINCHESTER, VA.—A brick Baptist church, 35' x 60', with a seating capacity of 350, and to cost $5,000, is to be erected here; from designs by J. A. & W. T. Wilson, architects, Baltimore.

WINONA, MINN.—The Bohn Manufacturing Company are now arranging to build a new saw-mill.

COMPETITION.

PROPOSALS.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS.

THE competition for the Boston Public Library building has been decided by the award of the four prizes: the first to Mr. Charles B. Atwood of New York; the second to Messrs. O'Grady and Zerrahn of Boston; the third to Mr. Clarence S. Luce of New York, formerly of Newport, R. I.; and the fourth to Mr. Horace F. Burr of Boston. Nearly all these gentlemen are already distinguished for their ability among the younger architects of the country, and unquestionably well earned the liberal prizes awarded them, and it is not their fault that none of the designs are regarded as suitable for execution. In fact, the competition seems to have been rather hastily arranged, and the competitors were confined by the requirements of a programme which allowed them far too little liberty in arranging their plan. It is as true in architecture as in other things, that nothing but the unexpected is sure to happen; or rather, to adapt the saying to the occasion, the best plan for a building is generally that which no one ever thought of before; and it is almost always a mistake to restrict designers to any model, or preconceived idea of what the arrangement of a given set of rooms should be. One does not always remember, for example, that there are five thousand and forty different ways in which a house of seven rooms can be planned; and he who would build such a house does best to allow himself the privilege of choosing any one of the whole number. With so important a structure as the Boston Library the number of possible arrangements is still greater; and although certain requirements must be fulfilled, they are usually such as would suggest themselves at once to an architect of the most mediocre attainments.

THE National Capitol at Washington seems to be in a fair way to be converted into a gallery for the exhibition of works by attractive female artists, if we may judge by the action of the Library Committee of the Senate, which reported recently in favor of the purchase of a portrait of the late General Thomas, said to be a colored photograph, by a Miss Ransom, at the remunerative price of ten thousand dollars; together with another picture, representing the Electoral Commission, by Mrs. Fossett, for fifteen thousand dollars. Not having seen the pictures in question, we will not undertake to pass upon their merit, and indeed they could not well be worse than many of those which disgrace the Capitol, and belie the public taste; but we are sure of a more important matter, that the ladies who painted them have no reputation which would justify the payment of such enormous prices out of the public treasury for their works. There are very few painters in the world who could get anything like ten thousand dollars for painting a portrait from a photograph, or who would not think it a piece of very unprofessional impudence to ask such a price; and we are unable to imagine either how those who are intrusted with spending the money raised by taxation from the people of this country can excuse themselves for wasting it in such inordinate compensation for work which would be dear at one-tenth the price, or how artists of honorable feeling can condescend to profit by such maudlin prodigality.

A POINT of extreme importance to architects is discussed in a recent number of *La Semaine des Constructeurs.* It seems that a certain proprietor some years ago had a house built by contractors, under the direction of an architect. The ground on which the house rested was not perfectly firm, and the building settled, causing a few little cracks in the walls. The proprietor took possession, and lived in his house for several years without complaining, or apparently troubling himself about these; but subsequently rented the house to a more particular individual, who demanded that the cracks should be repaired. The proprietor went to the contractor, who suggested that an architect should be called in, to say what ought to be done; but this proposition was refused. The tenant then, without further notice either to the contractor or the architect, called in an expert, who engaged workmen and had such repairs made as he saw fit; and after all was done the bill was presented to the original contractor, who very naturally declined to pay it. The correspondent of *La Semaine*, who tells the story, asks what are the rights of the various parties.

TO this question the editor replies that although the Code Civil provides that "if a building constructed by contract shall perish wholly or in part, even through defect in the soil, the builder and architect shall be jointly responsible for ten years," it has been decided by the highest court that in order to make the architect responsible it is necessary that the edifice should literally "perish wholly or in part," or, in other words, that "the damage must be serious." It is natural for walls of masonry, and for the ground on which they stand, to settle, and, although architects and builders can, and do, take certain well-known precautions to make the settlement uniform, it is impossible to foresee the direction and amount of all the movements with sufficient precision to avoid all cracking; and so long as the movements do not threaten the stability of the building, or make it unsuitable for habitation, neither the builder nor the architect can justly be held responsible for them. Moreover, even if there had been in the case cited such serious disorders as to endanger the structure, the proprietor and his tenant mistook entirely the method of holding the contractor and architect to the responsibility defined by law. To enforce this responsibility, if the occasion demands it, the architect or the builder, according as the fault is with the design or the execution of the building, must first be notified, and a reference agreed upon, to which he must be a party, and when the extent of his responsibility, if any, is thus legally settled, he can be called upon to perform the duty which the law requires of him. The report of an expert called in by the proprietor or tenant, without the coöperation of the builder, is worthless, and cannot be used against the latter; and an expert examination after the alleged defects have been repaired is likewise useless, since it is then impossible to say positively what the original defects may have been, and the responsibility of a builder or architect cannot be enforced upon anything short of definite and unmistakable evidence.

A NOVEL, but very commendable feature in school-house architecture has just been introduced in Edinburgh, where the famous High School, one of the most successful adaptations in Great Britain of Greek forms to modern everyday purposes, is to be enlarged by the addition of a gymnasium, and of a swimming-bath, in a separate building; or rather, a new janitor's house is to be built, and the old one altered over into a bath-house. The Scotch, like the Germans, have always been remarkable for their appreciation of systematic education, as distinguished from that picked-up information, mixed with misinformation, which so many persons mistake for knowledge, but the idea of teaching boys the second of the two great classic accomplishments in some reasonably efficient way seems never to have occurred to a School Board before. The apparatus by which the youth of Edinburgh is to be instructed in this manliest of all manly exercises is very simple. The janitor's house is to have the floors removed, and a tank, thirty-two feet long, and fifteen feet wide, formed in the centre, with a platform around it, and dressing-rooms and shower-bath near by. Although of such modest dimensions, the bath is large enough for such a school, and it is safe to say that it will not be long in operation before its advantages will become so

obvious as to lead to the establishment of similar appendages to many other schools.

THE *Builder* calls attention to the tendency of building in England, and points out in a striking way the influence which railway management has upon the movement of population in any country. Almost without exception the great cities of England have gained in population within the last ten years, while the country towns and villages have either remained stationary or have lost; but it is rather surprising to find that among the cities those situated on the coast have gained the most. Apart from the pleasant seaside resorts, like Bournemouth and Hastings, which have recently become very popular as places of permanent residence, the seaports of Grimsby, Hull, Cardiff, Gateshead, Hartlepool, and some others, have gained from thirty to sixty per cent in population within the last decade, while Manchester, the second city in England, has actually declined during that time, and other interior manufacturing towns have either lost, or have gained very little. The fact that manufactures have been transferred to seaport towns from the interior places, which depend on railways for their transportation, is too conspicuous to escape attention, and on examination it is found that the present system of freight charges on the English railways practically prohibits manufacturing in the interior of the country, while it fosters the importation of manufactured products from the Continent in a most effective manner. Thus iron wire, which was once made in great quantities in Birmingham, is now brought by sea from Antwerp to London, and thence carried by rail to Birmingham, at a total expense of four dollars and sixteen cents a ton; while the railway charge for carrying home-made wire of the same kind from Birmingham to London is six dollars and eighty cents. Antwerp is about two hundred miles from London, and Birmingham one hundred, so that, supposing the expense of transportation by sea, and transhipment, to be only half that of transportation by land for the same distance, the Birmingham manufacturer pays eight dollars and eighty-eight cents a ton more than the Antwerp commission merchant for carrying his goods to London. We do not know the price of wire in England, but, supposing it to be forty-four dollars a ton, the discrimination made against the Birmingham manufacturer by the railways amounts to an impost of twenty per cent in his largest market, to which his Continental competitor is admitted free of duty. It is needless to say that no honest business can long sustain such a burden, and the wire manufacture, once one of the principal industries of Birmingham, has been transferred to the new sea-coast manufacturing towns, where it is in a measure independent of the railways. Another town, near Birmingham, is Wolverhampton, where nails are manufactured in great quantities. The port most nearly in the direct route from Wolverhampton to Antwerp, the great distributing centre of the Continent, is Harwich. The present cost of transporting nails from Antwerp to Wolverhampton by way of Harwich, where they are transhipped, is three dollars and ninety-two cents a ton; while the charge for railway transportation alone from Wolverhampton to Harwich, about one-third of the distance to Antwerp, is five dollars and twelve cents a ton. It is evident that the exportation of nails from Wolverhampton to the Continent under such circumstances is out of the question, and the nail manufacturers who wish to supply foreign markets must either remove their works to the coast, where they will no longer depend upon the railways, or give up business.

IN a less degree the same powerful, though unseen influence, is modifying the distribution of population all over the civilized world. It is not an insane desire to live in dirty tenement-houses that draws working people everywhere to the great cities, but the greater certainty that they will find work there, which comes from the concentration of manufactures in them; and the concentration of manufactures in the cities depends upon the fact that the cities are what railway directors call "competing points," and that the same directors, in order to get away each other's business, are generally willing to carry goods between these and other "competing points" for less than cost, making up their loss by exorbitant demands from the manufacturers who have been so ill-advised as to build their works at points which are not "competing," and where they are in consequence at the mercy of the railway companies. In England, where combinations among the railway corporations have taken the place of competition, the number of "competing points" has been reduced so far that all the producers of the country are more or less in their power, and are unmercifully taxed in consequence; while foreign manufacturers, who need not send their goods over English railroads unless they wish, are allured by low rates and special favors to do so. Fortunately for the Englishmen, the sea is near them, and by transferring their business to the coast they can use a highway which is not subject to monopoly, but the process of transfer is costly, and before the interior of the country is quite deserted it may occur to some director that a railway line through an uninhabited country is usually unprofitable, and that a good local business, built up by patient courtesy and fairness, in a spirit of sympathy with the interests and needs of the people who inhabit the territory along the line, is far more remunerative to a railroad than the greedy extortion which treats persons who have the misfortune to need the services of the road as so much prey, to be plundered without mercy whenever they are caught at a disadvantage.

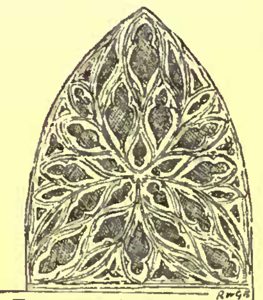
TO find an illustration of the operation of the same law in this country, we have only to open the annual report of a certain Massachusetts railroad company which happens to lie before us. The railroad owned by the company is one hundred and forty-three miles long, but it connects with other roads to form a continuous route both between Boston and the West, and towards the North, and carries a considerable amount of freight between the Mississippi Valley and the seaboard. In its statement of the last year's business of the road, the report says that "The earnings from local freight per ton per mile have been three and forty-four one-hundredths cents," while the earnings per ton per mile, from "freight to and from other roads" have been seventy-eight hundredths of one cent; and the earnings on freight to and from points west of the place where the roads connects with the westward system have been six hundred and nine one-thousandths of one cent per ton per mile. To put it in another way, this railroad has, through the year, charged all the manufacturers living on its line, and dependent upon it for transportation nearly six times as much for carrying their materials and goods as it has their competitors a little west of them, and four-and-a-half times as much as the ones to the north.

A VERY ingenious engineering operation was recently carried out in Philadelphia, for strengthening one of the piers of the Chestnut Street bridge over the Schuylkill River. The bridge, which was built, according to the account in the *Scientific American*, twenty-four years ago, consists of two metal arches over the river, with a pier in the middle, and two stone arches on each side, forming the land spans. The metal arches are each one hundred and eighty-five feet wide, and the stone arches between fifty and sixty feet. On the eastern shore of the river, the foundations of the piers and abutments rested on solid gravel, but at the western end of the bridge the gravel was overlaid with a considerable depth of silt, and, to save the expense of carrying the foundations down through this, piles were driven to the gravel, and the masonry built upon them. The piles were not very long, not more than thirty feet, according to the *Scientific American's* diagram, but the thrust of the metallic arch, which amounts to about two thousand tons horizontal pressure, was sufficient to push them slowly over, through the soft silt, moving the first western pier laterally about eight inches, and deforming the stone land-arches seriously. A temporary expedient was adopted some time ago for checking the movement of the masonry, by placing heavy timber struts across the opening of the land arches, below the level of the roadway, but these, though well placed, were liable to decay, and it was decided to substitute a permanent construction for them. On the suggestion of Messrs. Anderson and Barr, of New York, it was decided to secure the necessary resistance by means of concrete struts, extending from the foundation of the pier next the great arch obliquely through the silt to the rock, some forty-five feet below. A railroad track runs through the arch most affected, and it was important to avoid interfering with the passage of trains, so the necessary excavation was entirely carried on through iron tubes, eight feet in diameter, kept full of compressed air, and extended downward through the silt by the gradual addition of plates, after the method so successfully adopted for building the Hudson River tunnel. Four tubes were constructed, at such an angle with the base of the pier as to contain the line of thrust of the arch, and on reaching the rock were filled with concrete, forming an incompressible and permanent brace.

A SKETCH OF THE HISTORY OF ARCHITECTURE.[1] — III.



THE invention of stained-glass caused a great change in the form of the windows. Single narrow windows of great height were in use, but the desire for the display of color, and for the attainment of those beautiful effects produced only through stained-glass, led them to widen the windows, until they became overpoweringly large.

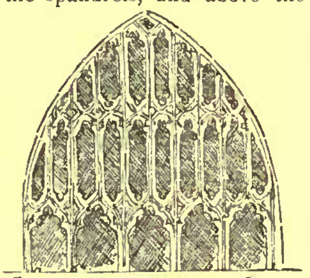


FLAMBOYANT TRACERY
FALASIA

But a farther step had to be reached before they could utilize the whole space between the piers for windows. On the introduction of the pointed arch in the groining, the required height in the walls was gained, and it was only necessary to carry the masonry of the vault through the side wall, and rest it upon an arch, springing from the sides of the piers, and then the centre wall below this discharging-arch was free to be done away with, and was in fact a simple screen, filling the space from pier to pier. The pointed arch was then used for the windows and the nave arches, to match with the vaulting. The form of window then in vogue was not altogether pleasing in its effect. The simple lancets set in triplets, and enclosed with a single pointed arch, left vacant spaces of stone in the spandrels, and above the smaller arched windows, and this led the French to abandon the geometrical forms, and to adopt a more flowing tracery. Having found the use of the discharging-arch above, they gave themselves up to the indulgence of all the vagaries of the style peculiar to themselves, and known as "Flamboyant." This was a great contrast to the style in use in England at the same date, called the "Perpendicular," or third pointed style. Every feature underwent changes, and the smallest and most insignificant mouldings were treated, as the styles altered, with care and taste.

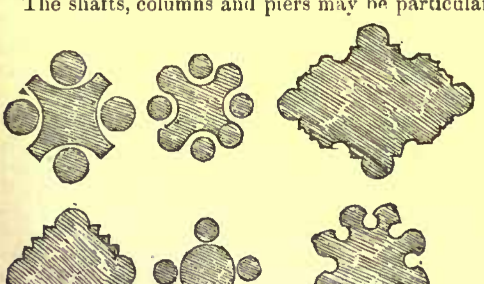


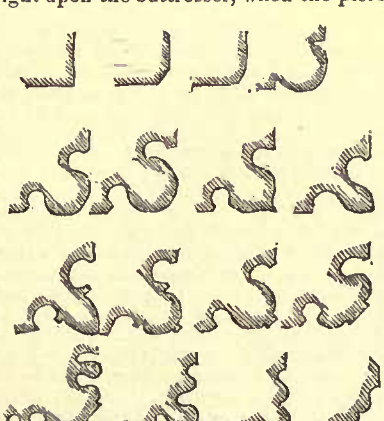
CAEN



PERPENDICULAR TRACERY.
SWINBROOK. ENG.

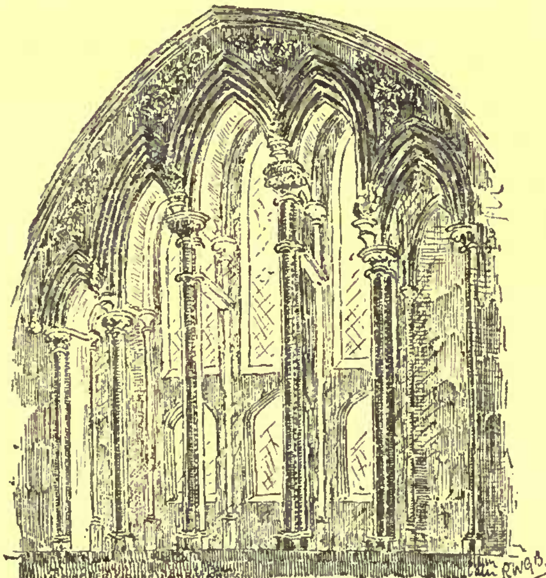
The shafts, columns and piers may be particularly noticed. First, the square pier, with semi-shafts attached, singly or in groups. The hollow spaces were increased in depth, and then such an amount of elaborate small moulding was introduced that the deep hollows could not be obtained, and a waving moulding was the result. Of mouldings, the accompanying diagrams will show the whole history. The extra weight upon the buttresses, when the piers were made to carry the whole weight of the roof, necessitated an increase of weight to assist in the resistance of the roof-thrust upon the buttresses; hence pinnacles were introduced, and these were gradually used as ornamental features, apart from the necessity that gave rise to their invention. In the capitals there may still be traced a reminiscence of the Roman Corinthian order, but under a very different treatment.





We have now rapidly run through the principal changes that took place, and seen the necessity of the hour provided for by the ingenuity of the architects, and most of these apply to the Pointed Gothic in every country, although each nation treated every detail in a manner peculiar to itself, imparting to the stone characteristics of their own, adapting each new idea to suit the requirements of the climate, and then reducing the whole to perfect proportions and harmony, and thereby perfecting an art whose existence began nearly six thousand years ago. Before we leave the subject, it would be greatly to our advantage to look more closely into the treatment by our forefathers of this Pointed Gothic style, for, starting upon the same lines as the French when first the pointed arch was introduced, they perfected for themselves a style which, for simplicity and beauty in the first place, and richness in the second, has not been equalled on any part of the Continent.

It has been usual to date the introduction of the Pointed Gothic into England 1200 A. D., but the vertical principles from which it sprung were not fully developed for nearly thirty years afterwards. Though at first this thirteenth-century or "Early English" style,



CHAPTER HOUSE CHRIST CH.
OXFORD, ENG.

as it is called, had much of the heaviness of appearance of the former style, yet it soon effaced all semblance of Norman by the development of its own peculiar and beautiful characteristics of high gables and roofs, the elongated window, the slender shafts, the lofty pinnacles and spires, and the lancet, as well as the equilateral-shaped arch. The mouldings were alternate rolls and deeply-cut hollows, not parts of circles in section, but they were treated with a freedom quite opposed to the geometrically correct method of a few years later. Salisbury Cathedral, erected 1220, is a perfect example of the style. By the grouping of the simple lancet windows, bold and beautiful effects were produced, and in no other country of the globe do we find anything similar; this and the third period of English Pointed Gothic or "Perpendicular," of which we shall speak later, being peculiar to our country. The Early English style reached its perfection in the middle of the thirteenth century, and towards the end we find much less freedom in the treatment of features and detail, until at last geometrical patterns became the regular mode of decoration. The hollows of the mouldings are correct semicircles, and the rolls themselves are far less prominent. The window forms underwent a striking change. Take, for instance, a triplet of lancet-windows of the Early English: a lofty centre one, and one on either side, considerably shorter, and these three enclosed under one drip or label-mould. In the new style known as "Decorated," or the second period of English Pointed architecture, the jambs between the lights are reduced to mere shafts, the spandrels above are pierced, and one large window is produced, the upper part of which was filled with rich geometrical tracery. One of the most elaborate and beautiful windows of this date is at Carlisle Cathedral, and has been well illustrated by Mr. Billings, in his work on that cathedral. There was no end to the variety of decoration and ornamentation used at this date, and we find most singular ideas embodied in stone, showing how thoroughly the masons understood the use of that material, how to apply its strength in difficult positions, and how to make it conform in every way to their wills.

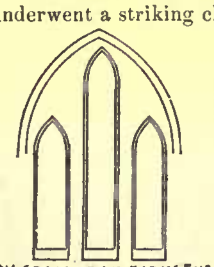


DIAGRAM OF AN EARLY ENG. WINDOW.

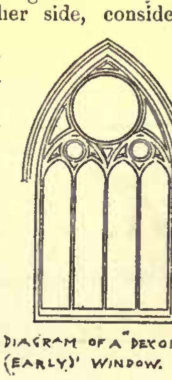
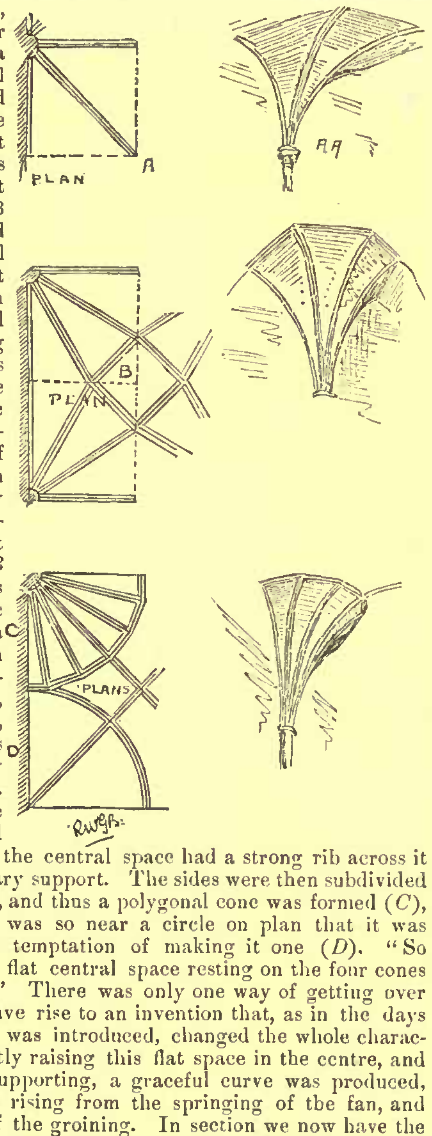


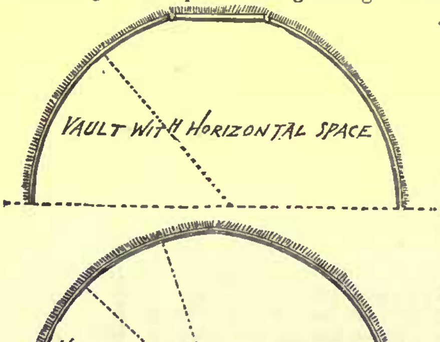
DIAGRAM OF A "DECORATED" (EARLY) WINDOW.

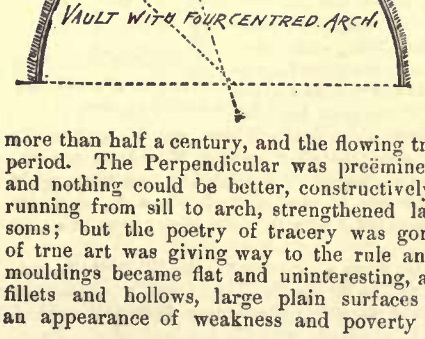
The English vaulted roofs were very superior to the French, the narrowness of the naves adding to the facility of construction. In all cases of early work, the vaulting shafts run from the ground through the clerestory, and terminate with the copings of the walls,

[1] A Sketch of the History of Architecture from the commencement of the Grecian Art to the Reformation in England, by R. W. Gambier-Bousfield, A.R.I.B.A. Continued from page 29, No. 473.

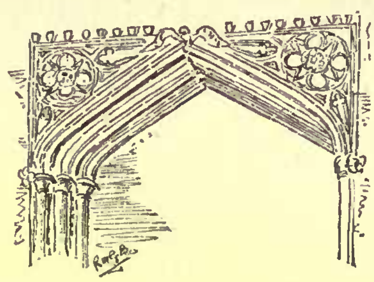
so that in this form they were evidently intended only to support wooden roofs, whose main timbers would rest upon the tops of these shafts. It may be that it was intended to cut them away down to the string-course, as was actually done at Norwich, in 1446, when the nave was vaulted; but in the beginning of the thirteenth century the architects were content with such roofs as that at Peterbro', which is the finest example we possess. St. Albans Abbey, in Hertfordshire, has a roof of corresponding pattern; it is a horizontal painted wood ceiling. At Durham there can be no doubt that it was intended to erect a hexipartite vault from the alternate piers and pillars, but before the walls had reached the height necessary for the springing of the vaults, the science had so far advanced that the idea was abandoned, and brackets were introduced to give support to the quadrilateral vault that now exists. This was successfully carried out between the years 1233 and 1284. The vaulted roof of Lincoln Cathedral may be taken as the first type of perfect English vaulting. The original form of the intersecting vault is that of two halves of a hollow-sided square pyramid, placed opposite one another in an inverted position. Half such a vault is shown at *A* and *AA*. Tracery was introduced to conceal the sameness, but at length the angle, as at *B* was cut off. This was an improvement in the appearance, but it left a flat square space, which would have been awkward in a central vault, although in a side aisle, where the space was smaller, it was easily concealed by ornament. By dividing each face into two, the original lines were restored and the central space had a strong rib across it which gave it the necessary support. The sides were then subdivided into any number of parts, and thus a polygonal cone was formed (*C*), that, as Fergusson says, was so near a circle on plan that it was impossible to resist the temptation of making it one (*D*). "So far all was easy, but the flat central space resting on the four cones was felt to be a defect." There was only one way of getting over this, and the necessity gave rise to an invention that, as in the days when the pointed arch was introduced, changed the whole character of the art. By slightly raising this flat space in the centre, and thereby making it self-supporting, a graceful curve was produced, struck from two centres rising from the springing of the fan, and continuing to the apex of the groining. In section we now have the *four-centred arch*, and the last step in the problem had been reached and the efforts of a thousand years were crowned with success. This four-centred arch was soon adopted for windows, doorways, and employed instead of the earlier forms for the nave and aisle arches themselves. This began the period of "Perpendicular," the least beautiful, so far as its details are concerned, of the three styles.



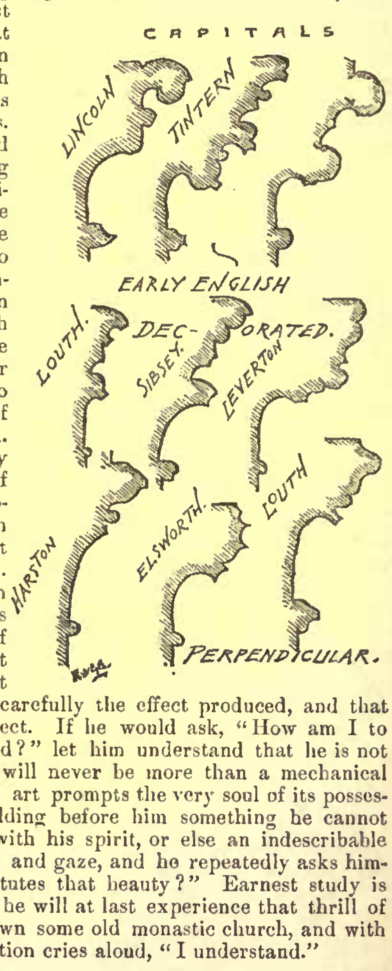




The geometrical forms lasted for little more than half a century, and the flowing tracery even a still shorter period. The Perpendicular was preëminently a constructive style, and nothing could be better, constructively, than the vertical lines running from sill to arch, strengthened laterally by various transoms; but the poetry of tracery was gone, the poetic inspiration of true art was giving way to the rule and the square. The very mouldings became flat and uninteresting, and in the place of rolls, fillets and hollows, large plain surfaces were introduced, giving an appearance of weakness and poverty deeply distressing when compared with earlier work. The outbreak of the Reformation, the seizure and destruction of the cathedrals, abbeys, and other monastic establishments, brought to a close the church-building age, and with it died out the spirit of the art, never to be revived as a national characteristic, never to be tended with a nation's love: dead forever, only to be used in imitation. And yet, can we speak of it as dead when the very stones themselves seem to speak again and forever, in the very silence of their beauty and solemnity? Do not the very mouldings live and smile in the play of light and shade that still surrounds them, as when they first were cut? Art was never born, and art can never die; it is, like the most precious minerals, hidden from human eyes, and can only be attained by deep research and almost endless care. Even when found, there still must be honest, willing, earnest labor before its glory is revealed; it is jealous of itself and slow to expose its beauty to the light of day.



We have taken a very rapid glance at the origin, discovery and development of the noblest of the arts. A very great deal more might have been said, and in fact a thorough description of each century's work would occupy volumes. The study of our art would take up the whole of a long life, but it is hoped that sufficient has been written to raise in the breasts of would-be architects an earnest desire to take up this study for themselves, that they may learn the true principles upon which their future designs should be based, and in true love for their art do their utmost to preserve the pure spirit of harmony in every detail. Architecture is so essentially an art, and the possession of an artistic talent so absolutely a gift, that no one can realize its spirit who has not been born with the talent. Beautiful buildings have been erected by modern architects — truly architects, masters of their art — and the student unable to visit Europe cannot do better than to consider carefully the effect produced, and that which has produced the effect. If he would ask, "How am I to know the good from the bad?" let him understand that he is not meant for an architect; he will never be more than a mechanical one. The instinct of innate art prompts the very soul of its possessor, and he sees in the building before him something he cannot as yet define, that clashes with his spirit, or else an indescribable beauty that makes him stand and gaze, and he repeatedly asks himself: "What is it that constitutes that beauty?" Earnest study is the next course for him, and he will at last experience that thrill of joy as he wanders up and down some old monastic church, and with the impulse of sudden conviction cries aloud, "I understand."



The Public Buildings Question.—The House Committee on Public Buildings was defeated, on the 8th inst., in its attempt to secure action on a number of bills for new public buildings in various parts of the country. A majority was in favor of consideration, but the opposition was led by Mr. Randall, who is an adept in dilatory tactics. It is generally considered that the committee has gone to the extreme in its liberality in the matter of public buildings. Several bills were passed at the last session and two have been passed at this session, one authorizing a new building at Waco, Texas, to cost $100,000, and the other, a building of like cost, at Carson City, Nevada. Besides these, the committee has reported, and there are now on the calendar fifty-two House bills, six of which have passed the committee of the whole, and fifteen Senate bills. The House bills authorize a total expenditure of $6,127,400, and the Senate bills $2,105,000 more, making an aggregate of $8,232,400. While public buildings in some of the places designated probably are necessary, and it would be a measure of economy to provide them, the necessity or economy of spending money for such buildings at many of the places for whose benefit bills have been brought in, is by no means apparent. The two classes of bills are so linked together, however, by an understanding between their friends, that it will be difficult if not impossible to separate them, or to consider any particular bill on its merits, unless by a suspension of the rules. Even then the danger of "log-rolling" can hardly be avoided. The men who want $50,000 for a building at Wichita or Opelousas will be likely to receive the aid of men who are striving in behalf of an additional $500,000 for Louisville or $700,000 for Pittsburgh.—*New York Tribune.*

THE MODERN ARCHITECT AND HIS ART.[1] — I.



The Revere Statue: to be erected in Boston. C. B. Dallin, Sculptor.

IN approaching the consideration of the modern architect and his art I feel, to use Mr. Lowell's recent words, that there is little chance of beguiling a new tune out of the one-stringed instrument on which we have been thrumming so long. Without, however, affecting to say anything new, "where everything has been said before, and said over again after," I desire to draw attention to a view of our art which has been singularly neglected, and which, to my mind, deserves infinitely more prominence than any words of mine can give it. What I have to say about modern architecture refers not so much to its archæological triumphs, its teeming types and annual revivals, nor to anything that therein is, but to that therein is *not*. So also, what I would say about the modern architect refers not so much to his wide knowledge, his daring anachronisms and matchless manipulations of historic ornament, but to his shortcomings — not to how he bewitches the general public by what he is, and what he could do if he tried; but to how the intelligent public may fairly be disappointed by what he is *not*, and what he cannot do. In a word, it is as to the scope — or perhaps I should say the limitation — of modern architecture and the ideal of the design (if he have any) to which I wish to draw your attention. Naturally I have chosen a subject which interests me, and, in pleasing myself, I hope I may please you; or at least I may offer an agreeable diversion to brains sorely racked and tired with studies and designs in various styles and periods. There is, I am aware, some danger attached to the criticism of a close profession like that of architecture, which has a royal charter dating from the seventh year of William IV, and which knows how to consume its own smoke. As, however, my point of view is quite an impersonal one, and my remarks general, and as I come before you without a single half-brick in my pocket to heave at anybody, my harmlessness is manifest. I shall then speak my humble mind with all the directness I can command, and trust to your kindness to take no offence where no offence is intended.

It is idle to shirk disagreeable questions, and so I begin with a simple proposition which covers much of the ground we shall traverse to-night. Is architecture, as practised by the modern architect, worth living for? It is a question I have more than once asked myself, but I am not candid enough to confess to you what reply I gave to it. In placing it thus in the forefront of this paper, let me say that the very last thing in my mind is to propagate doubt in the fold of the faithful where none exists; or to shake the confidence of such practitioners as are satisfied not only with the prospects of modern architecture, but with their own prospects and with the worth of their own contributions to the great volume of immortal art. To my mind the question is most suitable to the present time. I will not say that a "crisis" is approaching in the affairs of architecture, because the phrase has lost all its potency by frequent repetition in the newspapers, where we understand that a "crisis" in national affairs is upon us every second day. But I will say that these are critical times for us. A strange calm has come. There is a sense of impending change. This is a time of felt uncertainty, of stranded purposes, of searchings of heart — a time when the issues of things connected with the arts of designs are hanging in the balances. This is a time, too, of disillusionizing alike for architects and for people, when we ourselves are not quite so confident about our method of pushing architectural design forward by means of impulses of an essentially fleeting nature, and when people are beginning to realize that every branch of architecture is well represented by outsiders, and when they are beginning to question the *raison d'être* of the architect at all. This question is, then, a practical one, and one which it is desirable to face and to answer. It at once puts the modern architect and his art in their right place. It makes us compare ourselves not with ourselves (which is not wise), but with the masters of old who brought trained powers, sleepless ambition, and passionate devotion to their work. It has this good effect, moreover — it at once breaks the spell of that direful boa-constrictor of art, mere professionalism. Yes, and in addressing it to the Architectural Association, I cannot forget that I am speaking to those to whom the destinies of English design are to be committed, and it is for you to ask yourselves how you view and how you estimate the art you follow — whether you look upon architecture as a divinely inspired art that can rightly claim all the devotion of your being, or whether you take up architecture merely as an honorable profession and a gentlemanly calling. If you take up architecture as your vocation, to be followed with the ardor of a religion, I am not sure that you will succeed in gaining riches or fame; you may have to be happy with small opportunities and small gains, and have to live a life of quiet, unnoticed worth. But you will be happy and contented and grateful all the same. If, on the other hand, you go in for architecture as a profession which only needs the efficient handling of a T-square and ruling-pen, you may, if you are a good, steady fellow, rise to be an eminent practitioner. And if you are a successful practitioner your rewards are great; you may have access to the best society, and to the best columns of the *Times* newspaper; you may be a lion at evening crushes, and wear brown velveteen; you may pose as the patron of the very fine arts, and be a judge of *bric-à-brac*, and a connoisseur of Queen Anne teapots, Chippendale chairs, and such like; you may even hope to be the F.S.A. and the F.R.I.B.A., and even the P.R.I.B.A., if you have paid your subscriptions and are alive when your turn comes. Nay, if as architect and surveyor you have a sufficiently large and lucrative city practice, and have time for such things, you may aspire to reach the souls of the people by the art of your tongue as well as by the art of your hand, and almost succeed in adding M.P. to your other titles. And to win these rewards you have only to be a rough-and-tumble ordinary man of the world, with a head on your shoulders, an eye for figures, a well-supported air of general competency, good business qualities, some power of gracious fooling, and the faculty of turning out just what the world expects from you with promptitude and despatch. But as for art, and the mastery of the crafts, and the power of color and form and all that sort of thing, you may neither have any, nor need your friends suspect that such things come within the make-up of the modern British architect! Of course it is ever the snare of enthusiastic youth to press inconvenient speculations home, and it is because I am in the presence of the aspiring fledglings of artistic gifts and good parts who form the Architectural Association that the question as to the innate worth of modern architecture comes before me. In another place — where the birds are not only fully fledged, but have feathered their nests, and, like Jeshurun, are not exactly able to soar — I dare not hazard it, nor you either. Let it not be supposed that I have low opinions about architecture, or that I would willingly shake the allegiance of any young heart that has found peace in its pursuit. Let no waverer be downhearted; there may be a lucrative future before him. Let him stick to his last, by which I mean his T-square and ruling-pen.

To proceed. I said just now that this question touching the worth of modern architecture as a serious life's pursuit puts our art in its true place. Instinctively one feels that while it is applicable to the modern architect and his art, none but a fool would have put it to William of Sens, Jocelyn of Wells, Alan of Walsingham, William of Wykeham, Thomas Chard of Glastonbury, or to Bramante, Michael Angelo, Christopher Wren, Inigo Jones, or Adams or Chambers, and there must be a reason for this.

Again, none but a fool would ask the modern musician, or the sculptor, or the painter or poet if his art were worth living for. Indeed, here are living arts, each with its ideal conception to symbolize, each with its mission to stimulate, delight, and console mankind, and to raise men's minds out of money-grubbing grooves into a less selfish, less sordid, less commonplace atmosphere. It is significant that in each of these cases the artist is his own craftsman; he thinks his own thought, clothes it himself, and spares no pains in the elaboration of the clothing. He keeps no ghost, and if he does he is not thought to be respectable. But the architect's ghosts are legion — on his premises and off them — and he is not one whit ashamed. In calculating the place and mission of the modern architect, one is reminded of what is happening in the bee-world just now. By the aid of an ingenious patent, ready-made cells are stamped out in wax (adulterated of course) of the correct shape and size, and when placed in the patent hive the bees forthwith complete the cells, and fill them with honey. And the very counterpart of this is happening in the human world; the royally-instituted architect makes the cells, and the decorators and manufacturers fill them with honey. You know quite well that the English people have not to thank the British architect for the poetry of their homes. You know that one of the noblest provinces of architecture, that of turning necessary articles of daily use into works of art, has fallen from the architect's hands. You know that all the pretty things that dignify modern life come from the "largest furnishing establishments in the world" in Tottenham Court-road — from those homes of champagne and shoddy where the red sealing-wax "Early English" furniture, and the wood coal-boxes adorned with roses and daffodils, and the cast-iron over-mantel china closets come from; where you may get a dozen very cheap high-class native oil-paintings at one counter, and a dozen very dear native oysters at another.

Again, we must confess that the other contemporary arts I have enumerated have been affected for the better and not for the worse by the influences of the day. Each has won new triumphs, each has found out new chances of appeal, new domains for display. But not so architecture, for while it has gained nothing it has lost nearly all. In respect of the use of iron for constructive purposes, and of patent sanitary appliances, which builders and sanitary engineers have devised for us, we score something. Yet, however blessed the iron joists and D-traps are, and however lucky we are to be able to use them, the architects of old, who knew them not, were infinitely more accomplished all-round men than ourselves; and I do not know that, after all, our houses are either more stable or more sweet and wholesome for body and soul to inhabit than the old homes of old England.

But further. The practice of these arts of color, sound, form and word directly conduce to the development of artistic genius; nor could you be a successsul composer if you had no musical genius, nor

[1] A paper read by Mr. John D. Sedding, at the second ordinary meeting of the Architectural Association, on "The Modern Architect."

an eminent literary man without literary genius. Yet you can be accounted an eminent architect, and reap all the honors of the profession, without possessing or feeling the want of artistic genius. In putting the case thus strongly, do not suppose that I am blind to the noble gifts and genius of certain architects working with us and shedding their helpful influence amongst us at the present time; and, but for my resolve to keep this paper impersonal, I would name them and speak of them with all the genuine admiration and respect I feel for them. Do not mistake me on this point; I speak of rank and file, and not of these. And I ask whether architecture as now practised ought not rather to be accounted as a "useful" than as an "ornamental" — or, as some would call it, a "fine" — art? I ask whether architecture can any longer be termed the "Queen of Arts," when all that remains of her is the skull and the feet, and the palms of her hands? I ask if it be not true that architecture has ignominiously resigned her throne, lost her honors, and bartered the sceptre of preeminence with which she has held sway from time immemorial, and only reserved for herself the sovereign right of levying a tax of five per cent on other men's labors? I ask whether it is not true that the engineer has (whether civilly or uncivilly it matters not, as the thing is done) robbed the architect of one-third of his domain on the one side, and whether the decorator and manufacturer have not between them robbed him of another one-third on the other side? I ask whether the architect of to-day is, or need be, anything more than a paper-draughtsman to sit on a stool and invent new sorts of doors and windows? I ask whether his business in life is not that of a designer of shells of houses for decorators and manufacturers to finish and furnish, and who varies this jackal occupation by occasional jobs for an engineer, who hires him to do the "pretty" upon a bridge or railway station? Yes; and such of us who like to see iron skeletons clothed in shoddy ornament, may, after refreshing our bodies, refresh our souls at the York or Bristol railway station, and realize at the same time the mission and scope of the modern architect and his art.

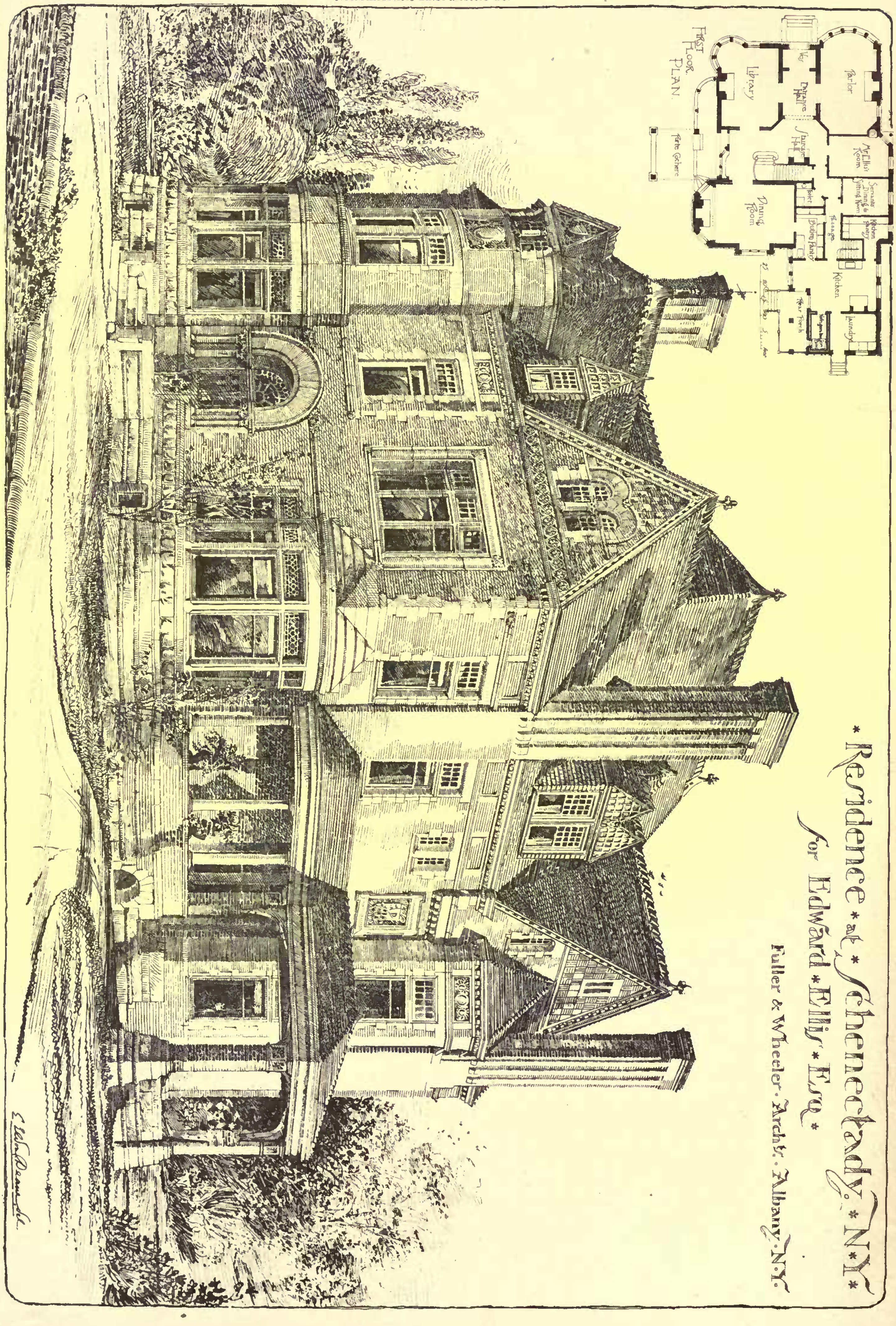
Now if you think that what I am saying is approximately true, you will agree with me that it is high time the position of the modern architect and the issues of his art were overhauled; and when this shall be undertaken, I know no better place for the investigation than under the roof of the house which contains the Royal charter, granted expressly to a certain institute for the advancement of architecture and the various arts and sciences connected therewith. If it be for the better advancement of the arts and sciences that architects abstain from personal relations with them, then it must be granted that they are, with much self-denial and self-abnegation, fulfilling the obligations of the charter under which they are enrolled. However this may be, I cannot help saying that, to my mind, every celebration of the Institute commemmorates not the marriage, but the divorce of architecture from the arts and sciences connected therewith. I have laid before you evidences of this in what has already been said, and it would be easy to go on multiplying the proofs. Indeed, it is an undeniable fact that the arts and sciences which of old were ever indissolubly connected with architecture, have passed to the care and conduct of the specialist and the manufacturer. The British public goes to its shops and specialists for any matter connected with domestic art; and if you are a parson with wants, you go to an ecclesiastical shop, and while one shopman is fitting on your coat, or taking the shape of your parsonic head for a new stiff hat, you can be ordering of another shopman a sculptured reredos, an altar and font and lectern, and that sort of thing. Yes, and I saw a striking letter the other day, written by the head of a well-advertised carving establishment, which stated that, inasmuch as not more than half a dozen of the writer's architect clients could prepare their own details in an artistic manner, he had started an office and a staff of clerks to do for the architects what they could not do for themselves. And remember that the architects here referred to were of the Gothic school, which represents the best masters of detail. Even in the matter of building houses, the better sort of builder has his own staff of draughtsmen (or compiling copyists, as some would call them), who can invent new sorts of windows and doors, and draw convenient plans, and make pleasing combinations of colored materials after the approved fashion. The public may soon begin to inquire wherein the architects' clerks and the builders' clerks differ. The State, as you painfully know, has a very summary way of dealing with the architect, inasmuch as it entrusts its buildings to the engineers and officials of South Kensington, and maintains an office of salaried draughtsmen for carrying out public architectural works. And what is happening at Kensington, where engineers combine with ornamentalists to carry out the State's architectural works, may happen in other cases; for the public will see that, given a good builder, an engineer, and an ornamentalist, any building is possible. And the architect has only his own sloth and incapacity to thank for a state of things which in process of time will assuredly work his own extinction. The experts he has called into existence have silently undermined his position. He called in aliens to help him in his need, and the alien army is a standing menace to his position, and will in time dispossess him. Lacking science and lacking art, he is just nowhere if the scientist and the artist combine for his effacement. There is a good deal of what Mr. Ruskin would call professional "bow-wow-wow" talked at our conferences and in the journals about the rights and wrongs of the profession; but what cares the world about the architect so long as its wants are somehow supplied? Although we abuse it, the world is fair in this respect, it values us at its own valuation of our worth. It knows we keep ghosts, and it makes no nicely-drawn distinction between an "expert" and a duffer!

But in order to clear the way for some few practical observations I must arrange the subject under three heads: — (1) What is architecture, and what were the functions of the architect in old days? (2) When, and from what cause did the change from the old to the new system take place? (3) Is it possible for architecture under its present conditions to be carried out upon the old lines, and, if so, by what means? Here are three points, each of which would serve as a theme for a long lecture, so that my treatment of each must needs be brief, and simply relative to the matter in hand.

As to the first point, although addressing a professional audience, I cannot define architecture as building erected after an architect's design. One might as well say that the snuff-maker was the final cause of the human nose! There is building which is, and building which is not, architecture; and I would define architecture as imaginative building: in other words, building which expresses the invention or imagination of the builder, and which appeals by this means to the imagination of the spectator. If it is to answer to the description of architecture, the building must have a soul as well as a body. The body is the structure answering to the primary purpose of its erection, and this body should be staple and convenient. The soul is that superimposed something extra to the body — that something which is provided beyond the demands of mere utility, and which is really the expression of the builder's thought and his mode of appeal to the sympathy and imagination of the spectator. In this definition you get the three cardinal virtues of architecture represented — namely, stability, which relates to science; convenience, which relates to good sense; and beauty, which relates to taste. Naturally, the primary purpose of a structure, combined with other like conditions, settles its character and the fit extent of its decoration; and yet, while it is quite fair to define the word architecture as the art of building nobly and ornamentally, you cannot gauge the value of a structure by the amount of its ornamentation. Dance, who built old Newgate, was an architect, and, although his structure has dead black walls of rough-hewn granite, relieved only here and there with niches and statuary, and a savage repellant air, it is imaginative building, and speaks directly to the imagination of the spectator of violence and doom in the true grim Northern manner. A mere builder would have put plain brick walls. And architecture all the world over has the same characteristic qualities — however different the types and the styles of the art represented, however different the scale of the structure, however different the culture and aims and methods of the builders — the architecture carries the impress of thought or invention, or imagination befitting an ornamental art. Architecture is truly a human art, a volume and record of human thought. As long as the structure remains you connect with it the memory of the men who build it. For instance, the monumental art of the west front of St. Alban's Abbey is a more lasting memorial of its reputed father — our only British architect — than the cracked bell at Westminster. And so with other immortal specimens of other immortal artists, "soft-handed" or otherwise. As you look at the architecture of Egypt and Greece you associate it with its authors. The work is steeped in thought, instinct with invention and — so far as its ornament is concerned — eloquent of pleasurable labor. It represents problems of proportions. Ideas are expressed with mathematical accuracy. In Greek art we have, as I need not remind you, the science of building united with accuracy of design and execution. The arts and sciences are here united perfectly. The tide of tradition is represented in full volume, and the designer is the exponent of traditions that commenced in Egypt, and flowed onward through the Greek and Roman and every other period till broken by the Gothic revival.

As I have just said, the architecture of the modern world answers, in all essentials, to the architecture of the ancient world, however different its aims, and character, and mode of appeal. With regard to the latter point, the Classic is a more intellectual art, and demands a more intellectual appreciation. The Greek architect is a man of complete culture, learned in philosophy and geometry, and he addresses his peers. This explains why it is some of us find the heights of Classic art cold, and the atmosphere that surrounds it bleak and grey. The modern architect, like the ancient, is the right man in the right place; and, whether he be cultured or uncultured, prince or ploughman's brother, he is the most skilled man in the building crafts upon the job. The difference is that, being a Christian, he is no respecter of persons, and being a modern, he is no respecter of calculated academic rule, but speaks his thoughts simply and spontaneously, and addresses his art both to learned and unlearned, to rich and poor, to bond and free.

But now, as I turn aside to define the functions of the architect under the old system, I at once feel the ground shake beneath my feet. For who can forget the storm of 1874, after Mr. Fergusson's unfortunate deliverance in the *Quarterly Review* upon this very head. The story of that time affords, I think, a really valuable glimpse into the secret motives of the British architect. The veil lifts for a moment, and he stands revealed with the touchstone of his art in his hand. Directly the elevated position, the professional status and social level of the architect is threatened from below, an army of "soft-handed gentlemen" rush to the rescue. Never in the annals of art (or the history of the Institute, which is the same thing) had so much power of eloquence, so much literary talent, and so much genuine enthusiasm been evinced. The British workman was



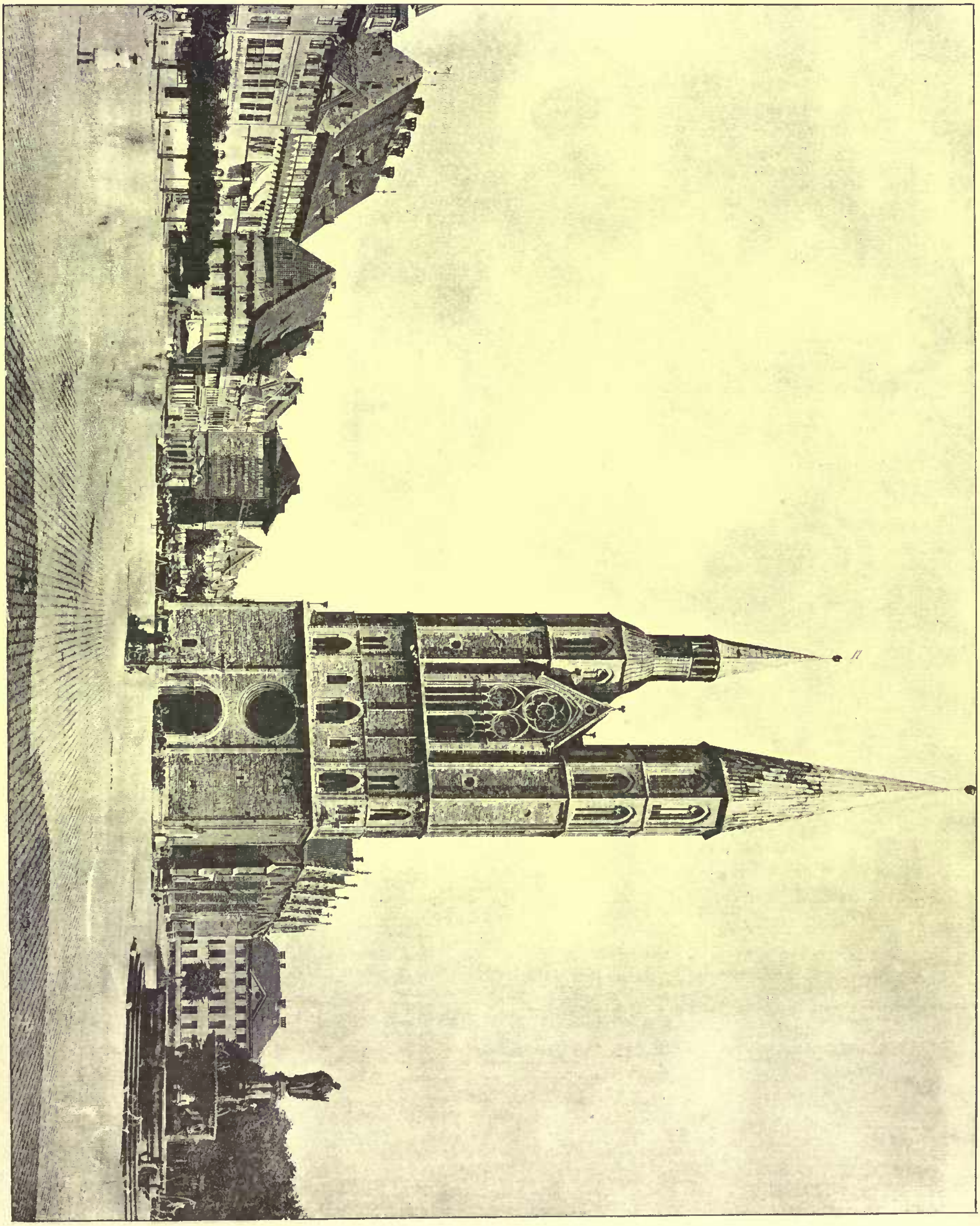
* Residence * at * Schenectady * N * Y *
for Edward * Ellis * Esq *
Fuller & Wheeler · Archts · Albany · N · Y ·
FIRST FLOOR PLAN
Parlor
Library
Entrance Hall
Dining Room
Kitchen
Laundry
Porte Cochere



PHOTO CAUSTIC, HELIOTYPE PRINTING CO. BOSTON

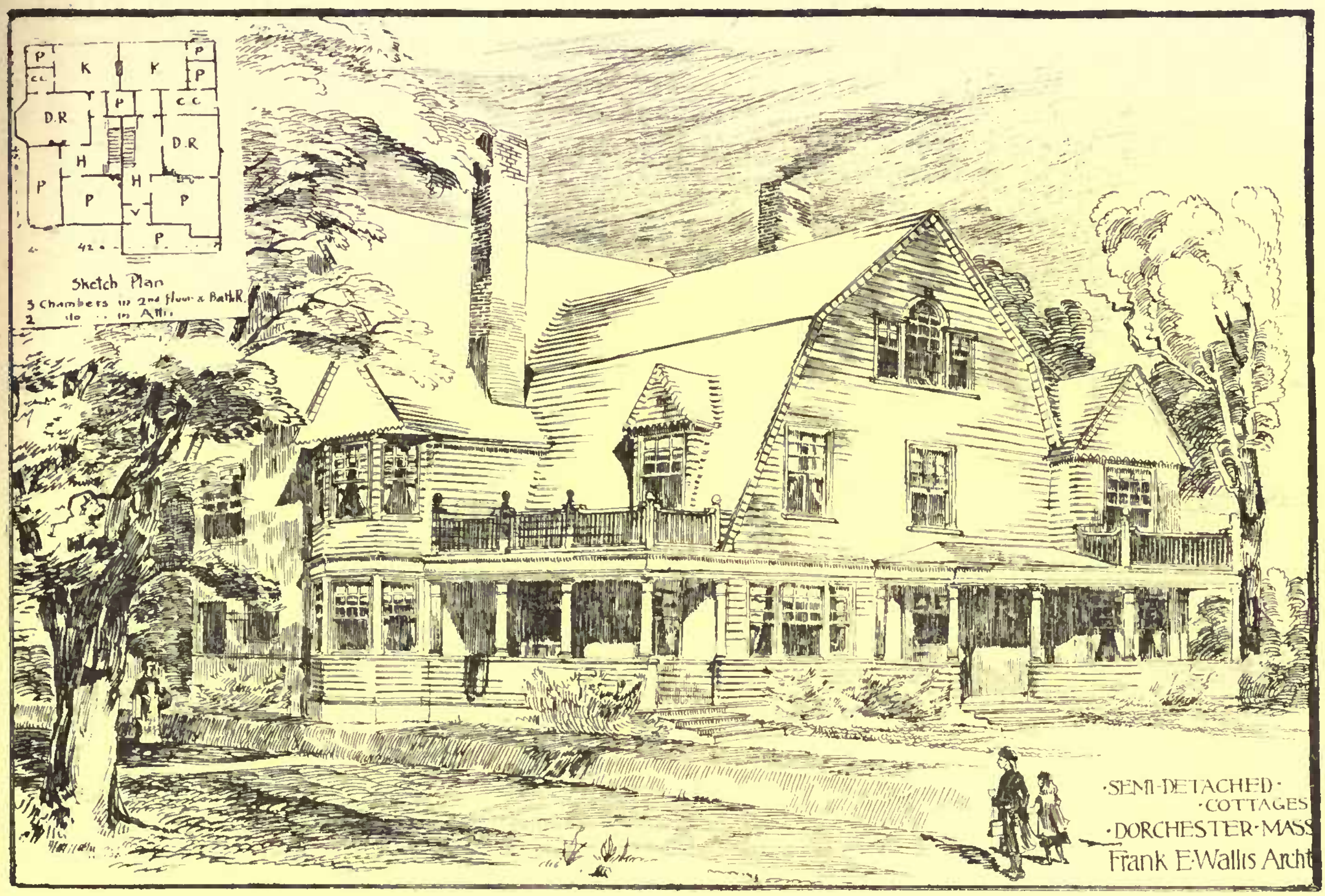
Notre Dame la Grande, Poitiers, France.

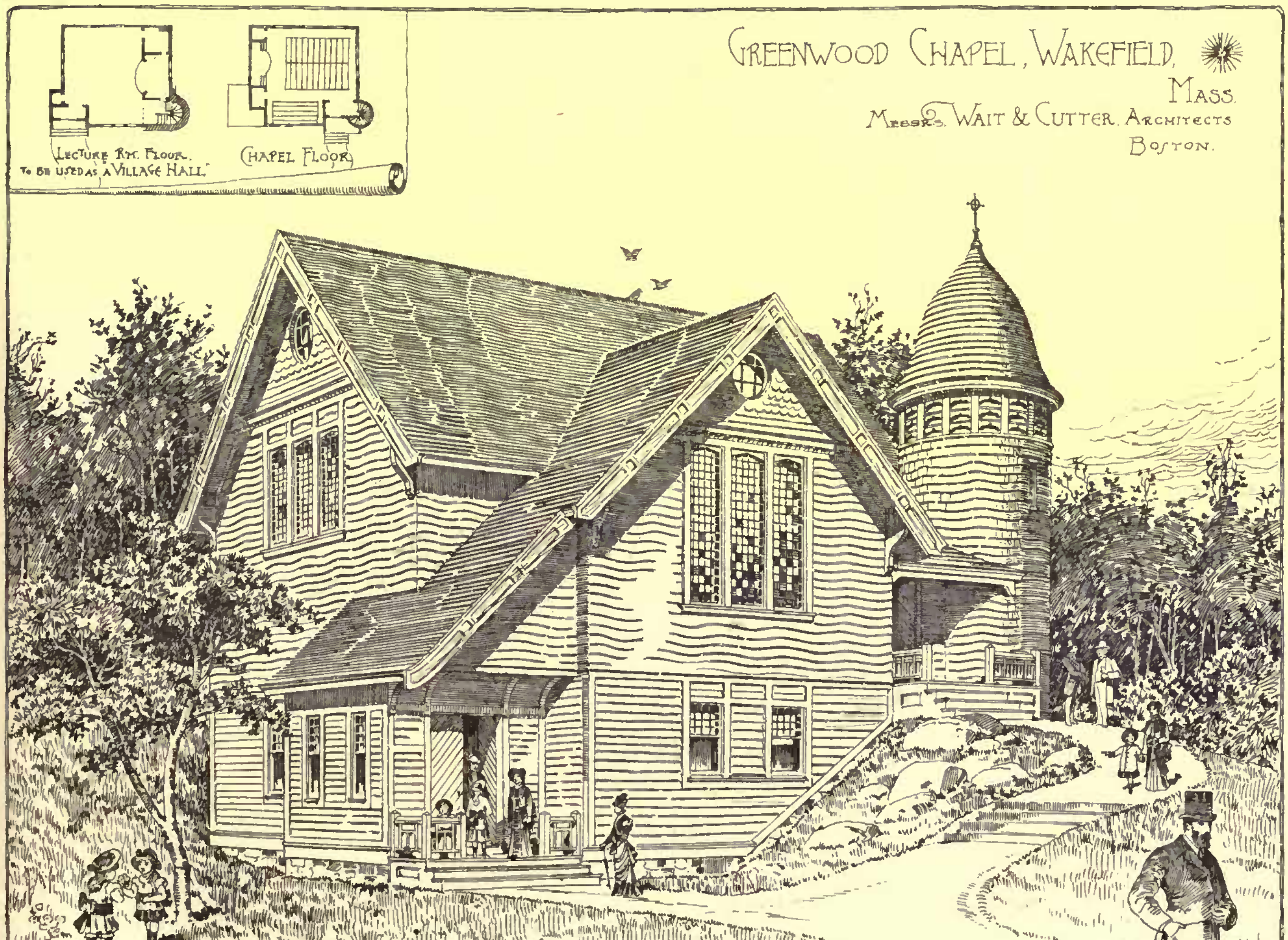
American Architect and Building News, Jan. 24 1885 No. 474



St. Catherine's, Brunswick, Germany. - 1884.

PHOTO-CAUSTIC, HELIOTYPE PRINTING CO. BOSTON.


Sketch Plan
3 Chambers in 2nd floor & Bath R.
2 do in Attic
·SEMI-DETACHED·
·COTTAGES
·DORCHESTER·MASS
Frank E.Wallis Archt


GREENWOOD CHAPEL, WAKEFIELD,
MASS.
MESSRS. WAIT & CUTTER, ARCHITECTS
BOSTON.
LECTURE RM. FLOOR.
TO BE USED AS A VILLAGE HALL.
CHAPEL FLOOR.
D.A. GREGG, DEL.

supposed to be on the march to Conduit Street, to demand enrollment as a Fellow of the Royal Institute, and to be, in this way, there and then constituted into an architect; and, although under the pressing exigencies of the case the parish beadle from the neighboring church, in all the majesty of his Sunday clothes, had been hired to watch the portals of No. 9, and although the Fellows had constituted themselves into a vigilance committee, in day and night relays, to guard their Magna Charta, something dreadful might have happened had the threatened invasion taken place. After all, however, the "unemancipated" British workman stirred not, but abode in his breeches, where I will return to him anon. Looking back at the pitiful affair (and the literature of the episode is innocently printed in the Institute's transactions, "by order of the Council") I have only one remark to make, namely, that whereas the architects were preposterously alarmed lest the workmen should become architects, it never struck them to try themselves to become master-workmen, and so to gain the respect of the workshops by their own eminence in the crafts, rather than by giving themselves airs because of their professional status and soft hands. Luckily for me, it is immaterial to our purpose to inquire as to the social status of the architect as a person, or whether he had soft hands or hard. One thing is certain about him — cultured or not cultured, hodman's cousin or not — he contributed the requisite amount of knowledge and theoretical science, and did not retain experts: he was in direct contact with the work as it grew up; he saw how things were done, and was not the mere figurer of details at an office; he was the familiar spirit of the building, and not the distant dictator of its details. And besides having a general knowledge of handicrafts, he was master of at least one. Some architects were modellers, some carvers, some workers in marble, or in gold, or in ivory, and, plainly enough, we can infer that they worked in workshops, and not in offices or studios. "In Greece," Winckelmann says, "the best workman in the most humble craft might succeed in rendering his name immortal."

Let us turn for a few moments to Italian mediæval art, for we know so much more about the architects of Italy than of those of any other country, and they afford us a ready type of men whose functions covered every matter pertaining to construction and ornament. The Italian architect was engineer, builder, painter, decorator, sculptor, modeller, metal-worker, goldsmith, and the rest; or at least you might expect that the same man could paint a picture, carve a subject, draw and model a bit of ornament, make a gold casket or an urn, design a dress or a fabric, build a church or a palace or a bridge. Thus we see how wondrously the arts were interwoven and technical skill was diffused in mediæval Italy. One craft overlapped the other; there was no hard and fast line of demarcation between them, as with us, and no professionalism, and no Salvation Army of specialists behind the scenes. Naturally, the poor Italian architect had never heard of the Native Asian, African and American styles so much in favor in our classes of design; but had he professed to design any sort of building, he would not have left it to the expert to fill it with plaster-work, or marble, or wood inlays, or bas-reliefs and color devices, and his art would extend to the provision of gorgeous chests and furniture, and perhaps even to the dresses and portraits of his esteemed clients. Think of Da Vinci, with his superb power of color and form, of his magnificent designs and projects in art and mechanics, and set this man, with his marvelous range, his almost superhuman grasp of mind and boundless ideal, against our puny selves poring over our D-traps and ventilation, and quantity-taking, Metropolitan Building Acts, etc., etc., and if, after instituting the comparison, you are satisfied with the scope and issues of the modern architect and his art, then I think you are eligible to be a Fellow of the Institute without further ado, and I will give myself the honor of proposing you on the first convenient occasion. Now you cannot properly account for the high condition of Italian art in the Middle Ages by saying that the Italian people are a phenomenal people with art in the blood. If so, art would be flourishing in Italy at this time, and it is not. The fact is, that whatever art you examine, of any period, or of any country, you will invariably find that the excellence of the work is only commensurate with the ideal. There is no luck, no chance about it; it is a simple matter of cause and effect, and if the members of the Institute had as high an idea of architecture, and of the various arts and sciences connected therewith as they have of the privileges of the profession and of their professional status, English architecture would be very different to what it is. It needs no prophet to foretell that so long as the modern architect contents himself with grovelling views, and consumes his soul in small things, so long will he grovel and do small things. In Italy, in the Middle Ages, there was a grand ideal to animate the artist and to sustain his art. Of course, many things conspired to favor art there and then, beyond the consanguinity with artistic races, which doubtless had its effect. Italy was then what England is now, the world's emporium, the seat and centre of the world's commerce. There was wealth, and the desire to spend it upon beautiful things. There was the ambition of cultured nobles; there was the inheritance of fine traditions; there was a lovely climate and a flowery land; there was the innate passion for beauty of a passionate and beautiful people. But what raised Italy to her high-water mark of art was the measureless value set upon execution. What Winckelmann said of Greece is equally applicable to Italy: the best workman in the most humble craft might succeed in rendering himself immortal. The designers themselves were masters in the crafts they dabbled in, and they had technical knowledge and technical skill. "Design" then meant something more than it at present does in an architect's office or in our classes of design. It meant the power to *do* as well as to *draw*. It meant executive power and technical skill; it meant that what the brain of the man could conceive that the hand of the man that conceived it could execute.

THE ILLUSTRATIONS.

THE "HOFFMAN ARMS." MESSRS. C. W. ROMEYN & CO., ARCHITECTS, NEW YORK, N. Y.

THIS apartment building was completed within the past year, is built of brown-stone, brick, terra-cotta, iron, and fire-proof material; the base is of brownstone rough ashlar; the bays of cast-iron, terra-cotta being freely used in the superstructure. The location, corner of Madison Avenue and Fifty-ninth Street, New York, is on property leased from the Hoffman Estate, from which it derives its name, and by which it was built through the aid of Mr. Thomas Kilpatrick. The building contains thirty-two apartments, is thoroughly fire-proof, and cost about $450,000.

HOUSE FOR EDWARD ELLIS, ESQ., SCHENECTADY, N. Y. MESSRS. FULLER & WHEELER, ARCHITECTS, ALBANY, N. Y.

ST. CATHERINE'S CHURCH, BRUNSWICK, GERMANY.

THIS church dates in part from 1252, but the south aisle was built in 1450, and the choir about 1500.

SEMI-DETACHED COTTAGES, DORCHESTER, MASS. DESIGNED BY MR. FRANK WALLIS, BOSTON, MASS.

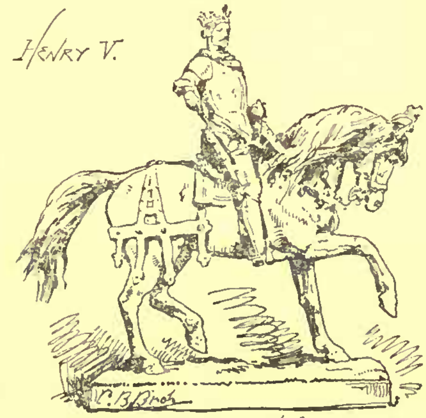
NOTRE DAME LA GRANDE, POITIERS, FRANCE.

GREENWOOD CHAPEL, WAKEFIELD, MASS. MESSRS. WAITT & CUTTER, ARCHITECTS, BOSTON, MASS.

SEWERAGE AND SEWAGE DISPOSAL AT PROVIDENCE.[1] — I.

BY GEORGE E. WARING, JR.

THIS large and elaborate report follows a tour of examination in Europe, made at the order of the City of Providence, by Samuel M. Gray, its City Engineer, assisted by Charles H. Swan, of Boston.



COMPETITION FOR EQUESTRIAN STATUES FOR BLACKFRIARS BRIDGE, LONDON. DESIGN BY C.B.BIRCH A.R.A. SCULPTOR

The investigations were made during the spring and early summer of 1884. Their chief purpose related to the disposal of town sewage, the object in view being to devise means for the relief of Providence River, which is now made most foul by the discharge of the sewers of the city. They included a personal examination of the principal works in England and on the Continent. To supplement the knowledge thus gained, schedules of questions were submitted to those in charge of works of sewage disposal. The replies from a certain number of towns, in response to these questions, are tabulated in three large supplement sheets published with the report.

Mr. Gray's investigations related both to the disposal of sewage, and to systems and processes of town sewerage and cleansing. These are described, and some of their details are illustrated by plates.

The ground covered includes not only the usual water-carriage systems of sewerage but the various methods of dry conservancy; the earth-closet, the movable tub, the ash-closet, the improved privy, the pail system and the Goux system; also the pneumatic systems of Liernur and of Berlier, and the pumping system of Shone.

Although containing little not already accessible in the literature of drainage engineering, this portion of the report is its best portion. It does not reach quite to the position of a hand-book, but it groups together in a convenient form much practical information. From the standpoint of the professional reader, the utility of this might well be questioned. It is really a thrashing of very old straw; we had been told most of it before, and more than once. In the direction toward which most of it trends, we had been told more than we find here. This, however, is not the standpoint from which this part of the work should be regarded.

The dead level of local tax-paying citizenship, probably as dead a level in Providence as elsewhere, cannot be impressed by work done in and for the world at large. It must put its hand into its own pocket, and send afield its own engineer, whom it knows and trusts, and must make a good big book of the result of his researches and of

[1] Proposed plan for a Sewerage System and for the Disposal of the Sewage of the City of Providence, R.I., by Samuel M. Gray, City Engineer. City Document, No. 25, 1884.

his lucubrations. Then it is moved — and moved to some purpose. What it gets may not be so good as what it might have got for less money in some other way, but what it gets it believes in and will act on: and so the world gets forward.

From this point of view this publication may be justified.

Apropos of nothing in particular, as it turns out, much attention is given to the relative merits of the combined and separate systems of sewerage, the latter first suggested in 1842 by Mr. Edwin Chadwick, and first carried out by Phillips in 1850–51 at Alnwick and Tottenham. The report says: —

The experience of English engineers has led them to consider it impracticable to exclude the rain falling upon private property from the foul-water sewers, because this would require two sets of house-drains in many cases: one for sewage, connecting with the sewer, the other for the surface drainage of the yard and roof, and leading to other channels. They consider that it would cause many complications, and that it would be an unwarrantable exercise of authority to require the construction of two sets of house-drains. They also consider that the admission of a limited amount of rain-water to the foul-water sewers is an important factor in maintaining their cleanliness, and the prevailing practice with them, when separation is attempted, is to exclude only the rain-water in the streets and public squares, and to admit the rain-water from yards and the rear roofs of houses.

The practice in this country has tended towards a more complete separation of the sewage and the rainfall. This is due in part to the extreme views of some of the advocates of the separate system, and in part, no doubt, to the difference between the climates of the two countries; heavy rainfalls being more common here than in England.

The separation of the rainfall from the sewage becomes important when the sewage must finally be pumped, and when it must be treated chemically or used in irrigation. On the other hand, the separation of the sewage from the rainfall becomes important when the rainfall passes into streams that must afterwards serve as the sources of public water-supplies. These conditions, demanding separation, are frequently found associated together.

The question as to the necessity for separation, and of the proper method of removing storm-water, is further complicated by the fact that the first wash of water after flowing over the streets of cities, being contaminated with the droppings of animals and other filth, becomes a variety of sewage possessing nearly, if not quite all the constituents of ordinary sewage, except the peculiar germs of disease associated with human excrement, and except certain chemical products derived from manufacturing waste. By thorough and systematic scavenging, the streets may be kept in such a condition that the storm-water may cause little harm if permitted to pass directly into the streams; but this ideal of sanitary work is seldom attained, and the first washings of the streets during storms are usually extremely foul.

Another phase of the surface drainage of towns presents itself in the larger Northern cities in winter, when a thaw occurs after a long period of snow. The mingled accretions of snow, ice and filth, that have been weeks in accumulating, are then liberated in liquid form in great volumes, and require prompt removal. At such times the capacity of sewers receiving surface-water is severely taxed, ordinary surface channels are so obstructed as to require constant attention, and floodings frequently occur in lower districts, travel being greatly impeded, and property in basements and cellars being often damaged.

The great cost of sewers large enough to convey all the waters of heavy storms has already been referred to, it being prohibitory in most instances. Consequently the question as to the best method of removing storm-water is reduced to a consideration of the objections, from the sanitary or from the financial point of view, to the admission of a portion of the surface drainage to the sewers conveying sewage.

The advocates of the separate system claim, among other things, that some of the earthy matters carried into the sewers by turbid storm-water, particularly building-lime, act as precipitants and cause the deposit of organic matters within the sewers, intermixed with deposits of road detritus, leaves and twigs, brought into the sewers by storm-water. These deposits, when not removed by the ordinary flow of sewage or by flushings, must remain until the next heavy storm, and meanwhile become the source of noxious exhalations.

The essential difference between the two systems, as regards cleanliness and freedom from deposits, arises from the fact that in the separate system the substances to be removed are derived from domestic and manufacturing wastes, while in the combined system there are, in addition, the substances brought into the sewer by the storm-water. Thus, while the scouring power of the sewage in the combined sewers is, at best, no greater than in the separate sewers, and may in certain cases be less, the amount of deposits in them may be greater, and their nature may be such as to render them more difficult of removal. Another result derived from the use of small pipes, as in the separate system, is that a given volume of water, such as the contents of a flush-tank, will produce a greater scour and will more completely wash the interior of the sewer; or, to state it differently, a less amount of water will be needed to remove a given obstruction.

Great stress is laid by the advocates of the separate system upon the more perfect ventilation of the sewers when their size is small, as compared with the ordinary volume of sewage flowing through them.

It is also claimed that organic matter adheres to the upper portions of the interior of sewers of the combined system when they are conveying storm-water, and remains after the storm has ceased, forming a slimy coating; that this soon becomes putrid and promotes the development of swarms of microscopic organisms. On the contrary, it is claimed that the sewers of the separate system, being filled every day to their maximum working capacity, afford less opportunity for the growth of noxious germs.

A comparison between the separate and combined systems from the financial point of view cannot be made explicitly, as such a comparison must be based upon local circumstances to a certain extent. This much, however, may be said concerning it: —

The cost of a sewer depends upon a number of elements, some of which are independent of the size contemplated; thus the cost of sheeting and bracing the trench, of pumping water from wet soils, and, to a very large extent, the cost of excavation, back-filling and paving will not be essentially reduced by diminishing the size of the sewer. The difference in cost occasioned by the use of a smaller sewer is, however, generally in favor of the smaller sewer.

A comparison between the cost of a system of combined sewers and of a system of sewers from which surface and subsoil waters are excluded, will generally show that the latter can be built more cheaply. It should be remembered, however, that the greater cost of the combined system is offset by the provisions for the admission and removal of storm-water. If the necessities of the locality require that the surface and subsoil waters shall be removed by underground conduits, their cost should be added to the cost of the house-drainage sewers, in order to make the comparison valid. Should these underground conduits be equal in extent to the system of house-drainage sewers, the cost of the entire combination will usually exceed the cost of a combined system. In most instances the conduits for surface and subsoil water need not be co-extensive with the house-drainage sewers, nor do they need to be placed at so great a depth. Consequently a great many places exist where a separate system would remain the cheapest after the addition of the cost of the necessary channels for removing the surface and subsoil water.

This long quotation has been given as an example of the fairness of spirit with which Mr. Gray has endeavored to consider and to represent the moot questions arising in his discussion. A few of the suggestions, however, may be open to criticism.

Too much importance seems to be given to the foul condition of street wash at the beginning of a storm. The instances which have long been referred to in sanitary literature as proving that the sewage of towns without water-closets is as foul as that from towns with water-closets were, for modern purposes, vitiated by the fact that in the non-water-closet towns referred to a vast deal of household liquid, especially kitchen slops, is discharged through the street sewer. This becomes after decomposition as objectionable as does the discharge of water-closets and it is much greater in quantity. It is hardly fair to suppose that a modern town which is ready to spend several millions to secure a proper disposal of its sewage would neglect so obvious and important a feature of its cleansing processes as the removal of street dirt, horse-droppings, etc., by some better system than their delivery into public sewers during occasional rain-storms. This "ideal sanitary work" is fast being accepted as rudimentary and indispensable sanitary work. When the question of purifying the outflow of the sewers becomes serious, proper street sweeping will be adopted as a matter of course.

As to the accumulations of snow, ice and filth which adds so much, and so much that is objectionable to the flow of the sewers in winter thaws, they are delivered into streams at a season when they are at least objectionable, and they do not of themselves constitute a sufficient source of nuisance to be regarded as an important factor in the problem.

Not only is the ventilation of the small sewers of the separate system more complete than that of the large sewers, but as the report indicates, the need for ventilation is relatively less, because of the absence of retained putrefactive deposits.

As to the financial comparison made, there is one element of the cost of large sewers which is overlooked: *i. e.*, the cost, where the trenches are in unstable ground, of keeping the work open for the slower process of brick laying. With small pipe sewers, especially with prepared joints, the laying of the conduit occupies so little time that if the bottom can be kept to grade even for a few minutes the pipes can be put in place and the work at once closed in. It is true that the provision for the admission and removal of storm-water in the case of the combined system is of much value, and from the purely financial point of view it may at times, but by no means always, be cheaper to make such provision; but surely, if any subsequent treatment of the sewage becomes necessary, if it is to be pumped or purified chemically, or used for irrigation, the admission of storm-water, — which means the complete pollution of the storm-water — becomes a source of great added cost. The same is true of ground-water which is allowed to find its way into the sewer.

It is not easy to conceive of conditions requiring the sewers for storm-water removal, and the removal of house drainage to be co-extensive, consequently the suggestion that "the cost of the entire combination will usually exceed the cost of a combined system" cannot be accepted as a valid argument. There is no instance recorded of the greater cost of the sewerage of a city by the separate system than by the combined system, and it is doubtful whether one-half of the cost has ever been reached.

In discussing the relative merits of the two chief systems of artificial disposal — chemical purification and irrigation — the tendency of Mr. Gray's arguments and their natural deductions are decidedly in favor of the latter, as an adjunct of "separate" sewering. Whether on the score of cost or of the purity of the effluent, he shows the well-understood advantage of the application of sewage to the soil; but when he comes to make his recommendations his heart fails him, and — leaving his newly-acquired knowledge in abeyance, he advices the chemical system for which, it is true, European experience gives ample precedent — disregarding the serious defects that this experince has shown that system to possess.

The problem presented to Mr. Gray for solution seems to have been this, and only this: To withhold from Providence River and its tributaries the foul matters now carried into them by the outflow of the sewers as at present constructed and as to be extended hereafter.

To dispose of underground water or surface water or sewage *as water*, is no part of it; the sole aim is the suppression of the fouling of the streams and bay. In the solution of this problem he seems to have assumed either that it is necessary, or that it is a matter of indifference to diffuse the foul wastes of the city throughout the whole mass of its drainage effluent, including the large amount of subsoil water, — which his guagings show to be an important element of the flow, — the storm-water falling on the covered and uncovered areas of the city, and so much of the water-supply as is used in fountains and elsewhere, as well as that which has already been fouled in its passage through houses, mills, etc.

If any radical criticism is to be made concerning the scheme it must relate to this fundamental part of it.

Argument may be based both on the actual condition of the sewerage of the city, and on its ultimate extension to the complete drainage of the whole area, after its population shall have reached the 300,000 for which provision is made.

He assumes that the total outflow of the sewers will amount then to 58,000,000 gallons per day. This includes 1-100th of an inch of rain-water per hour from the district drained, liquid wastes from manufacturing establishments, amounting now to nearly 5,000,000 gallons per day, and 60 gallons per inhabitant, *including ground-water*.

The present daily dry-weather flow is 3,000,000 gallons. There are about 50 miles of sewers carrying the sewage of 36,421 persons, and this, with the present mill flow is the chief source of the present fouling. To provide only for the purification of the present flow would be unwise. Whether or not it is wise to provide now for the sewage of 300,000 persons depends entirely on the relation between interest on cost, and the cost of added construction when it shall be needed. In discussing the method of disposal adopted by Mr. Gray it is only fair to accept his figures.

The plan is to construct, at a cost of $2,195,973, main and intercepting sewers to collect all drainage of whatever character from all parts of the area under consideration, and to lead the whole to Field's Point, some distance below the city; that is, the whole excepting the excess of storm-water beyond 1-100th of an inch per hour; when this amount is exceeded the surplus is to flow into the rivers, carrying foul sewage with it.

Steam-pumping apparatus is to be provided at a cost of $275,133, capable of lifting 58,000,000 gallons per day to a height of 28 feet.

To these items there should be added for "engineering and contingencies" fifteen per cent, making a total of $2,841,772.

The question now arises whether this effluent may be most efficiently treated by chemical process or by irrigation. Mr. Gray decides in favor of the former for the reason that an acre of land would be required for each one hundred of the population, or 3,000 acres in all; that this land cannot be obtained in a suitable position; and that the cost of sending the sewage to such land as can be obtained would be very serious. He seems to admit that, as we all know, the completeness of purification would be greater if the sewage were applied to the land, but he believes that by chemical process it may be made sufficient.

He therefore provides for tanks, conduits, filter-press, mixing machinery, etc., land, right-of-way, damages, etc., at a cost of $857,732.

It would seem proper to add to this cost the capitalization of the annual cost of working and maintenance. It would be a moderate estimate to fix the cost of pumping at five cents for each million gallons raised one foot high, or $1.40 for each million gallons raised the whole 28 feet provided for. The dry-weather flow is estimated at 60 gallons per person, which for 300,000 population, would make 18,000,000 gallons. Add to this the present mill waste (5,000,000), and we have 23,000,000 gallons to be pumped per day at a total cost of $32.20, or an annual cost of $9,869.30. It would be moderate to estimate the cost of pumping storm-water for a year at $2,140.70 making the total cost of operating the pumps $12,000 annually. The capitalization of this annual payment at four per cent would be $300,000.

The estimate does not refer to the annual cost of the chemical purification of the sewage, but from the indications given, 50 cents per annum per person would be a low estimate. It is the lowest cost suggested in the report. This with a population of 300,000 would make an annual outlay of $150,000, which capitalized at four per cent, would be $3,750,000.

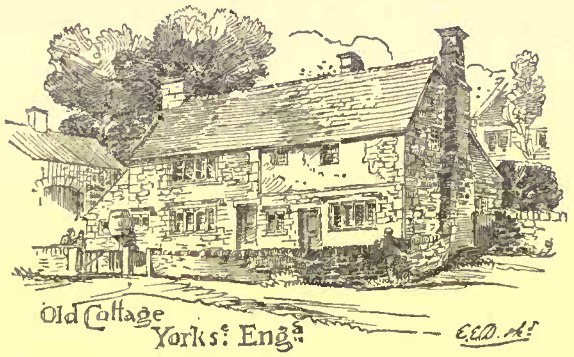
Adding together the estimated cost of construction and the capitalization of the assumed annual working-expenses, we have a grand total of $6,891,772.

Providence is a very rich and prosperous city. It can afford to spend whatever is necessary to secure any needed sanitary improvement and to purify its harbor; but it will hardly rush into an outlay of this magnitude without inquiring carefully whether or not the work can be done for less money.

To be continued.

THE WORKSHOP OF A PREHISTORIC ARMORER. — The archæologist, M. Saillard, known through his efforts for the preservation of dolmens, has discovered the workshop of a prehistoric armorer or smith, on a steep rock by the sea on the southwest side of the Peninsula of Quibéron (Brittany). It dates from the Stone Age. Polished lances, arrow-heads, axes and other objects are represented in great numbers and in every stage of manufacture, so that the discovery is most interesting, inasmuch as the objects illustrate the workman's method and process. Among the objects is also a meteoric stone worked into an implement. The skeleton of the workman was also found, the skull being very well preserved.—*N. Y. Evening Post.*

A SUBTERRANEAN EXPEDITION.



A CORRESPONDENT of the London *Times* says that the underground phenomena found in certain portions of the southern and Adriatic provinces of Austria, including miles of underground caverns, lakes that disappear and reappear at regular seasons, and rivers that are swallowed up by the earth, and come to the surface again many miles distant, have recently been the object of much attention on the part of the Austro-German Alpine Club, and of the Club degli Alpinisti of Trieste. A section of the members of the former body determined some time ago to institute a systematic exploration of the subterranean course of the River Reka. Rising in the Schneeberg, in Carniola, this mysterious stream suddenly disappears in the so-called Karst caverns. At San Giovanni di Duino, twenty miles distant from the spot where the Reka is lost, a river of corresponding magnitude is found issuing from the foot of a hill. This stream is known as the Timavo, which takes a westward course and discharges its waters into the Bay of Monfalcone. As to the identity of the Timavo with the Reka there cannot be a doubt, although until the present year no attempt had ever been made practically to demonstrate the fact. The members of the Austro-German Alpine Club, who had resolved to explore the underground meanderings of the river, made their preliminary reconnoissance on March 30th last.

Starting from the first great cavern, called the Rudolph's Dome, the expedition, consisting of four persons in two boats, proceeded on their eventful voyage. From the cavern just mentioned, the river flows for 200 feet through a narrow channel between two perpendicular walls of rock, estimated to be upwards of 100 yards in height. At the end of this channel, the explorers, whose course throughout was illuminated by the magnesium light, found themselves in a vast cavern, where they were able to land. Fastening up their boats, they proceeded for some distance on foot past several cascades and rapids. They followed the course of the stream without much difficulty for a considerable distance, after leaving the newly-discovered cavern, keeping to the left bank at first. At length they reached a spot where the river contracts to a width of barely twelve feet. Here they were compelled to cross to the right bank, which they did by help of a wooden ladder, they had with them. The advance now became more difficult, the explorers being only able to get forward by creeping and climbing. At length they came to the sixth waterfall, which the party was unable to pass. The river here runs between two perpendicular walls of rocks, and suddenly takes a downward leap of over 20 feet. From the Rudolph's Dome where the start was made to the sixth waterfall, the distance is rather over a furlong, and requires half a day to accomplish. At the third attempt the four gentleman forming the expedition, succeeded by help of suitable ladders and other apparatus in getting over this cataract, and advancing some distance beyond it. They soon, however, came to a seventh waterfall, where they were compelled to turn back. They found that to make any further progress, it would be necessary to get a boat past the last waterfalls, as there is no standing room on either side of the stream, but sheer perpendicular walls of rock. The further exploration of the underground river will be resumed as soon as the requisite apparatus can be got ready. In the meantime the Alpine Club has decided to make the approaches to the Rudolph's Dome cavern more easy of access to the general public. The second cavern, which was discovered in September, is of far greater dimensions than the Rudolph's Dome, or any of the other caves of this district. Its height is upwards of 450 feet, so that it could easily contain the Cathedral of St. Peter's at Rome.

With regard to the Italian Alpine Club, its committee has during the the past summer done some good service by rendering the splendid cavern of Trebitsch, discovered by Herr Lindner, 40 years ago, accessible to the ordinary tourist. The cavern can only be approached by descending a deep shaft down which visitors have hitherto had to clamber on the bare rocks. The Club degli Alpinisti have now caused a series of ladders, seventy-four in number, to be fixed. The Trebitsch cavern is 300 feet high, 400 feet in width, and 1,000 feet in length. Through it flows a river, which several authorities believe to be identical with the Reka and Timavo, but the hypothesis is repudiated by many observers. The question can only be settled when the Austro-German Alpine Club shall have accomplished the interesting task it has taken in hand — that of following the subterranean course of the River Reka from its beginning to its termination.

THE ARCHITECTURAL ASSOCIATION OF MINNESOTA.

St. Paul, Minn., January 9, 1885.

To the Editors of the American Architect: —

Dear Sirs, — The Architectural Association of Minnesota held its fourth annual meeting at 219 Nicollet Avenue, Minneapolis, on Tuesday, January 6th, 1885, at which the election of officers for the ensuing year resulted as follows: —

President, Isaac Hodgson, of Minneapolis; Vice President, D. W. Millard, of St. Paul; Secretary, H. S. Treherne, of St. Paul; Treasurer, F. G. Corser, of Minneapolis.

Board of Management: E. P. Bassford, of St. Paul; A. F. Ganger, of St. Paul; G. M. Goodwin, of Minneapolis, and W. C. Whitney, of Minneapolis.

After the meeting the members adjourned to the West Hotel, where they partook of the annual banquet.

The Association is in a flourishing condition, there being forty-two members on the roll, twenty-five of whom have joined during the past year. Yours sincerely,

H. S. Treherne, Secretary A. A. M.

NOTES AND CLIPPINGS.

French Art Exports to America.—The business of exporting art products from France to America has suffered greatly from the American duty on pictures and other art creations. The American Consulate has just been compiling the statistics of the art exportation from France to the United States during the past three years. In 1882, the exports were of the value of $1,800,000; in 1883, $1,200,000; and in 1884, only $600,000.—*N. Y. Commercial Advertiser.*

Turner's Refusal of an Offer. — It is a well-known fact that, during the later years of his life, Turner was unable to sell a large number of his pictures, although he seldom asked for them a higher price than the modest 200 guineas which was considered in those days a sum of money considerably beyond the market value of the artist's work. A certain Scotch gentleman, named Munroe, a famous collector of pictures, enjoying an income of from 25,000 to 30,000 a year, greatly admired Turner's genius, and finding him one day sitting solitary in his gallery, surrounded by some of his finest works, for which he had tried in vain to find purchasers, Munroe suddenly determined to make the artist an offer of a certain sum for the whole collection. "Let me have all these," he said, "and I will write you at once a draft for £25,000. Will you agree to that?" Turner appeared not altogether displeased at this offer, but told his friend to go and walk about the streets for half an hour or so, and at the end of that time come back for his decision. This Munroe accordingly did, but at the end of the half-hour, greatly to his disappointment, Turner answered him in the negative, refusing to part with his pictures, even for a sum which at that time would be considered a very large one. Eight or nine of Turner's finest works were among those which Mr. Munroe would gladly have purchased with his £25,000, but as these identical pictures have since become the property of the National Gallery, the admirers of Turner will no doubt rejoice that the Scotch collector was so unsuccessful in his generous bid.—*Pall-Mall Gazette.*

Smoke-testing of Drains. — The only objection to the smoke-test for drains, hitherto, has been that it was troublesome and expensive to apply, chiefly owing to the weight of the apparatus used in applying it. It has been considered necessary to generate the smoke in an iron vessel on the surface of the ground, and from thence to pump it down by means of a centrifugal pump, or fan, into the drain to be tested. As both the generating vessel and the pump were heavy, the use of them involved the necessity of the engineer's going to and from the house to be tested in a cab, and also taking an assistant with him to work the pump. Acting upon a suggestion thrown out by my friend, Mr. A. B. Brown, the eminent hydraulic engineer, of Edinburgh, that the smoke required might be generated inside the drain by means of a "rocket," I have lately devoted a good deal of time to designing cases of different shapes and sizes, and getting them made and filled with a suitable composition by Mr. James Pain, the well-known firework maker. On Saturday, in Christmas week, several of the engineers of the London Sanitary Protection Association, and myself met Mr. Pain's representative at an unoccupied house in Kensington, to try a number of different sizes and shapes of "smoke rockets," and give Mr. Pain an order for the one which seemed most suitable. The one fixed upon is 10 inches long, 2 1-4 inches in diameter, and with the composition "charged rather hard" so as to burn for ten minutes. This gives the engineer time to light the fuse, insert the rocket in the drain, insert a plug behind it, and walk through the house to see if the smoke escapes into it at any point, finishing on the roof, where he finds the smoke issuing in volumes from the ventilating pipes. The house experimented upon on Saturday had three ventilating pipes, and the smoke issued in dense masses from each of them, but did not escape anywhere into the house, showing that the pipes were sound. If the engineer wishes to increase the severity of the test, he throws a wet cloth over the top of the ventilating pipe, and so gets a slight pressure of smoke inside it. The "smoke rocket" is not protected by any patent, and if any person wishing to try it writes to Mr. James Pain, 1 St. Mary Axe, E. C., for "Innes's Smoke Rocket," specifying the size, he will be supplied with any quantity. The plug used with them is made by Mr. Francis Botting, of No. 6 Baker Street, and consists of two short frustra of cones put together small end to small end, with a central screw to draw them together, and a large rubber ring, such as one sometimes sees on the fetlocks of horses, round the circumference, so that screwing up the screw expands the ring, and unscrewing it allows it to contract. This plug answers for applying the water-test to drains as well as for the smoke-test. — *Cosmo Innes in the Journal of the Society of Arts.*

Failure of an Artesian Well Boring. — After an attempt lasting two years and a half, and involving an expenditure of over $25,000, the Winchester Repeating Arms Company has abandoned its attempt to secure an artesian well on its premises. The Arms Company was charged so much by the New Haven Water Company for its supply of water that an independent supply was sought, but, although the work occupied several times as long as was expected, no artesian supply has been obtained, and the manufacturing concern must remain dependent on the water company. The bore, six inches in diameter, had reached a depth of 2,400 feet about two months ago, when some maliciously-inclined person dropped down the bore several pieces of iron one day while the men were at dinner. These pieces of iron wedged in about fifty feet of steel boring tools, and when more than a month had been spent in trying to remove the contents of the bore, the work was abandoned by the contractor. The contract provided that payment should be made by the foot, and for some forty days before the boring tools reached the point where they now remain, the contractor had averaged a net profit of $115 per day. All the expense of trying to remove the obstructions was dead loss to him, and he now says that as a result of his contract he has lost two years and a half of his life without compensation and $1–500 in cash besides. A year ago he was $10,000 ahead on his contract. The obstructions in the bore weigh, he says, about 3,000 pounds. There is only one deeper bore in the world, and that is in a Pennsylvania oil well. The Winchester bore lacks only 240 feet of being half a mile deep.—*New Haven Palladium.*

Replanting Blown-Down Trees.—The following account of how we reinstated several large trees blown down here last winter may be of some service sooner or later to your readers: The trees in question were limes, a hundred and thirty years old, ninety feet high, from ten feet to twelve feet in girth, and had been blown over with at least two and one-half tons of earth attached to their roots; indeed, it was this last condition that settled the determination to proceed with the lifting. The trees were first pollarded at a height of thirty feet from the ground, and even after this had been done, there could not have been a less weight than two tons of timber to be uplifted, but which was nevertheless done in a remarkably short time, and, comparatively speaking, in a very easy manner, by means of the following appliances, viz.: a common two-and-one-half-foot screw-jack and a crab capable of raising five tons, which had a one-and-one-half-inch rope attached, and common cart-ropes for stays and guides. These being all placed in position, it was found that no pulleys and shears would be needed. And so, the holes being duly prepared by breaking up the "pan" on which the trees had grown, and which, by reason of the roots not being able to penetrate it, was the cause of their downfall, a start to raise them was made by two men at the screw-jack, and as each few inches were gained, props of varying length, each one held by a separate man, were placed as directed by the superintendent, and in this way was secured the height obtained by every move of the screw-jack. As soon as the end of the trunks had in this way been raised to a height of from fifteen feet to eighteen feet, the crab was brought into play, and soon the trees were again in their upright positions, and having been well attended to as regards good soil, well consolidated about the roots, there can be no reason to doubt that they will not only live, but grow away as vigorously as ever they did. Should they do so, many besides myself will seriously consider whether or not it is worth while to be at all times in such a hurry to cut up noble trees that have had the misfortune to succumb to a storm.—*W. W., in Woods and Forests.*

The Frogmore Mausoleum. — The memorial service in the Prince Consort's mausoleum, on Sunday week, was somewhat altered from the programme which was used in the time of Dean Wellesley, and it was shorter than formerly. The musical portion of the service had been selected by the Queen and Princess Beatrice, and had been carefully rehearsed by the boys of the choir of St. George's. This mausoleum is one of the most splendid tombs in Europe, and it is a great pity that so bad a site should have been selected, for it is necessary to have fires perpetually burning, summer and winter, in order to keep the beautiful and very costly decorations from being injured by the damp. The building lies in a perfect marsh. The coffin of Prince Albert is enclosed in a sarcophagus of granite, which is in the centre, and which is large enough to contain two coffins, the Queen designing to be herself buried here. The crypt underneath contains nine niches, and was intended to be the burial-place of the Queen's children; but, so far, it has not been used, as Princess Alice was buried at Darmstadt (there is a statue of her in the mausoleum) and the Duke of Albany in the royal vault. It was arranged that the Duke should be buried here; but the plan was reluctantly changed by the Queen, when it was found that he had left written instructions that his coffin should be placed in the family vault under the Wolsey Chapel. The Queen and the Duchess of Albany visited the royal vault during the recent stay of the court at Windsor, in order to inspect the final arrangements which have been made for the disposal of the late Duke's coffin, which has just been enclosed in an oak case, on the top of which is a silver plate, with his titles, etc., and at the head is his coronet, on a cushion. The members of the royal family have always been buried in coffins covered with crimson velvet, with massive silver ornaments; but a few years ago, when the Queen paid her first visit to the sepulchre, she observed that the coverings had become ragged and faded, and orders were given that all the coffins should at once be placed in new oak cases, on the top of which are the plates and coronets. The Duke of Albany lies on the stone table in the centre of the vault, with King George of Hanover, George III, and the Duke of Kent. The other coffins are on the shelves on each side of the vault, which is entered through two gates, from a passage which communicates with the vault beneath the choir of St. George's Chapel. The Prince Consort's coffin was never really placed in the royal vault, but, till it was removed to Frogmore, it stood on a bier in the underground passage just outside the gates of the vault. I believe that the Queen objected to her husband being buried, even temporarily, in the same place with George IV.—*London World.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

310,550. LIME-PAINT. — William I. Adams and William R. Polk, Baltimore, Md.
310,566. SHUTTER-WORKER. — Julius Aars Dyblie, Cummings, Ill.
310,579. SASH AND DOOR STICKER.—John H. Glover, Oshkosh, Wis.
310,596. HEATING-STOVE. — Silas H. La Rue, Reading, Pa.
310,603. FIRE-ESCAPE.—Lewis B. McDonald, Little Rock, Ark.
310,625. COMPOSITION FOR GRAVEL OR GRANITE ROOFING, ETC.—Thomas Vaughan, Millvale, Pa.
310,631. SHINGLING-BRACKET.—George W. Adams, Boston, Mass.
310,633-634. STEAM-RADIATOR. — Juan B. Arci and John Chapman, Brooklyn, N. Y.
310,637. HOOD FOR SHUTTER-HINGES. — Chas. W. Barnekow, Newburg, N. Y.
310,662. TERRA-COTTA PAVEMENT.—John M. Freeman, Steubenville, O.
310,667. HOISTING - APPARATUS. — Duncan Gilchrist, Ishpeming, Mich.
310,675. FIRE-ESCAPE. — Tomas P. Hall, Toronto, Canada.
310,678. DEVICE FOR SECURING MOULDINGS. — Charles Halstrom, Los Angeles, Cal.
310,687. CLAMP FOR DUMB-WAITERS. — David D. La Baw, Jersey City, N. J.
310,710. GUIDE FOR BORING DOORS FOR LOCKS.—Chas. Nichols, San Francisco, Cal.
310,713. CHAIR FOR ELEVATOR GUIDE - POSTS.—Charles G. Otis, Brooklyn, N. Y.
310,714-715. STEAM-RADIATOR.—William H. Page, Norwich, Conn.
310,721. WINDOW-GUARD. — John Polkowski, New York, N. Y.
310,731. LEVELLING-ROD. — Robert B. Seymour, Willet's Point, N. Y.
310,738. ELEVATOR. — Israel S. Smith, Sr., Washington, D. C.
310,752. DOOR-CHECK.—Alonzo B. Walker, Canton, Ohio.
310,807. BALUSTER.—James W. Ferer, Renova, Pa.
310,818. PIPE-WRENCH. — Jas. F. Guthrie, Somerville, Mass.
310,824. SHEET-METAL ROOFING-MACHINE.—John L. Holton, New Lisbon, O.
310,825. BLOWER FOR FIRE-GRATES. — Stephen C. Houghton, San Francisco, Cal.
310,839. BENCH-VISE. — William Mickel, Oneonta, N. Y.
310,841. DOOR-CHECK. — Emil Niggli, San Antonio, Tex.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report eighteen permits have been granted, the more important of which are the following: —

John Flanney, 3 three-st'y brick buildings, com. n e cor. Druid Hill Ave. and Wilson St.

John T. Miller, 24 two-st'y brick buildings, s s Carroll St.; and 24 two-st'y brick buildings, n s Ward St., bet. Bayard and Wooster Sts.; and 12 two-st'y brick buildings, e s Bayard St., bet. Carroll and Ward Sts.

Louis V. Wise, 5 three-st'y brick buildings, e s Carey St., n of Lafayette Ave.

J. Bauernschmidt, three-st'y brick ice-house, w s Monnt St., bet. Pratt and McHenry Sts.

Jos. Hampson, Jr., 5 three-st'y brick buildings, n s Patterson Ave., bet. Fulton St. and Bruce Alley, and 2 two-st'y brick buildings, w s Bruce Alley, n of Patterson Ave.

Henry Weber, 12 two-st'y brick buildings n s Canton Ave., bet. Lucerne and Rose Alley.

Boston.

BUILDING PERMITS.— *Wood.*— *Centre St.*, near Rockville St., dwell., 30′ x 30′; owner, W. A. French; builders, Urquhart & Frazer.

Grampian Way, n Savin Hill, dwell., 23′ x 23′ 6″; owner, Clarence A. Door; builder, James J. Emroe.

Adams St., near Butler St., poultry-house, 8′ x 12′; owner; William Brooks; builder, A. H. Pierce.

Philips St., Nos. 24-26, cor. Longwood Ave., dwell., 12′ x 48′; owner, Bridget Coppinger; builder, A. H. Pierce.

Water St., dwell., 20′ and 16′ x 39′; owner, Michael Downey, builder, A. C. Tully.

Hyde Park Ave., cor. Richards Ave., dwell., 20′ x 25′; owner, Michael Blackwood; builder, R. M. Stevens.

Spring Park Ave., cor. Centre St., wagon-shed, 20′ x 25′; owner, Richard English; builder, Samuel Beal.

Armandine St., cor. Milton Ave., dwell., 20′ and 25′ x 28′; owner, Ephraim Moulton; builder, Ephraim Moulton.

Whitfield St.; cor. Wheatland Ave., stable, 22′ x 30′; owner, H. F. Cross.

Washington St., cor. Walnut Park, dwell., 28′ x 34′ and 35′; owner, E. F. Dunbar; builder, A. J. Nickerson.

Brooklyn.

BUILDING PERMITS. —*Seventh Ave.*, e s, 82′ n Eighth St., three-st'y and basement brown-stone dwell., wood and tin roof; cost, $7,500; owner, Chas. Long, 450 Ninth St.; builder, J. F. Wood.

Bushwick Ave., w s, 17′ s Grove St., 2 three-st'y frame (brick-filled) dwells., tin roofs; cost, each, $3,600; owner, H. L. Bartlett, 805 Quincy St.; architect, Frank Holmberg.

Bushwick Ave., s w cor. Grove St., three-st'y frame (brick-filled) dwell., tin roof; cost, $3,600; owner, etc., same as last.

Duryea St., s s, 100′ w Bushwick Ave., two-st'y frame (brick-filled) dwell., tin roof; cost, $3,200, owner and builder, Wm. Widnall, 1073 De Kalb Ave.; architect, John Herr.

Seventh and Eighth Sts., 440′ e Third Ave., 6 (three on each street) two and three-st'y brick dwells., gravel roofs; cost, each, $3,500; owner and builder, Peter Donlon, 724 Sackett St.

De Kalb Ave., n s, 100′ e Reid Ave., 2 three-st'y brick flats; cost, each, $5,000; owner, Ella Ellis, 55 Devoe St.; architect, Ernest Dennis.

Hamilton Ave., n w cor. Gowanus Canal, one-st'y frame store-shed, felt and gravel roof; cost, $24,000; owner, American Cotton Oil Co., 2 William St., New York; architect, Aug. Hatfield; builder, Hugh Getty.

Smith St., n e cor. Hamilton Ave., four-st'y brick and bluestone mill; also, one-st'y extension, boiler-house; also, two-st'y extension, office, composition roof; cost, $30,000; owner, etc., same as last.

Tenth St., s s, 95′ w Fifth Ave., 5 two-st'y and basement brick dwells., tin roofs; cost, $3,500; owner and builder, Robert Little, One Hundred and Sixty-sixth St., near Forest Ave., New York; architect, R. Van Brunt.

Lexington Ave., s s, 200′ w Throop Ave., 5 two-st'y brick dwells., tin roofs; cost, each, $3,000; owner and builder, Jas. W. Stewart, 373 Quincy St.; architect, M. Walsh.

Broadway, s w cor. Jefferson St. and Saratoga Ave., 4 three-st'y frame tenements, tin roofs; cost, total, $10,000; owners, R. & H. Goodwin, 868 Bushwick Ave.; architect, J. T. Miller.

Dean St., s s, 175′ w Franklin Ave., two-st'y brick ice-house, tin roof; cost, $8,000; owner, Budweiser Brewing Co., Franklin Ave., cor. Dean St.; architect, J. Platte; builder, J. Rauth.

Jefferson St., s s, 190′ e Throop Ave., 6 three-st'y brown-stone dwells., felt and gravel roofs; cost, each, $5,000; owner and architect, William V. Studdiford, 241 Broadway, New York; builder, not selected.

Evergreen Ave., w s, 50′ n Troutman St., three-st'y frame (brick-filled) store and dwell., tin roof; cost, $4,000; owner and builder, Geo. Loeffler, 78 Jefferson St.; architect, Henry Vollweiler.

Van Buren St., s s, 179′ e Bushwick Ave., 3 two-st'y frame dwells., tin roofs; cost, each, $3,000; owner and builder, Samuel Post, cor. Van Buren St. and Broadway; architect, H. Vollweiler.

Evergreen Ave., w s, 75′ n Troutman St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $3,800; owner and builder, George Loeffler, 78 Jefferson St.; architect, Henry Vollweiler.

Van Buren St., s s, 195′ w Bushwick Ave., two-st'y frame (brick-filled) dwell., tin roof; cost, $3,800; owner and builder, Samuel Post, cor. Van Buren St. and Broadway; architect, H. Vollweiler.

Chicago.

BUILDING PERMITS. — J. A. Wessel, two-st'y store and flats, 2903 Butler St.; cost, $3,900; builder, M. Batta.

J. M. Williams, three-st'y store and flats, 175 East North Ave.; cost, $6,000; architect, E. F. Berlin; builder, G. Wolff.

F. Heimberg, three-st'y dwell., 36 Rees St.; cost, $1,500; architect, J. Zittell; builder, J. Hellman.

M. Walsh, two st'y livery stable, 120 Twenty-fifth St.; cost, $8,000.

F. C. Wells, two-st'y livery stable, Thirty-fifth St.; cost, $10,000.

J. Jansen, 3 cottages, 714-718 Shober St.; cost, $3,-400.

J. D. Robertson, two-st'y dwell., Forest Ave.; cost, $3,000.

H. Hooper, 3 two-st'y dwells., 206 Dearborn Ave.; cost, $10,000; architects, Burling & Whitehouse, builders, Barney & Rodatz.

Wm. Kensilla, 3 two-st'y flats, 39-43 Spruce St.; cost, $15,000; architect, A. Speyer; builder, F. C. Nogle.

A. H. Lowden, 2 two-st'y dwells., 3247-3249 Rhodes Ave.; cost, $11,000; architects, Wheelock & Clay.

New York.

EXCHANGE BUILDING. — The Building Committee of the New York Mining Stock and National Petroleum Exchange have drawn up plans for their new building. It will be on Broadway. The ground will cost $700,000 and the building $590,000.

STORES.—For the Lorillard Estate, a six-st'y iron and brick store, about 40′ x 126′, is to be built at Nos. 138 and 140 Centre St., from designs of Mr. J. B. Snook.

For Messrs. Jos. Andrade & Co., six-st'y basement and sub-cellar building, 25′ x 145′, is to be built of brick, stone and iron, at No. 95 Bleecker St., from plans of Messrs. Alfred Tucker & Co.

From designs of the same architects, a seven-st'y and basement store and warehouse, 64′ 6″ x 119′, is to be built on the s e cor. of Houston and Crosby Sts., for Messrs. G. Sidenberg & Co., the fronts to be of granite, iron, brick and freestone.

For Mr. Carl H. Schultz, a mineral-water factory is to be built on the corner of Ave. A and Twentieth St., from designs of Mr. Ed. E. Raht.

Messrs. Donaldson Bros. will erect a factory for the lithographing business, on the n s of Park St., commencing 116′ e of Pearl St.

HOUSES. — Messrs. A. Tucker & Co. are drawing plans for a four-st'y and basement brown-stone house, 23′ x 65′, to be built for Mr. Henry Maibrunn, on the s s of Seventy-eighth St., 148′ w of Ninth Ave., and for a three-st'y and basement brick and stone residence, 25′ x 45′, to be built for Mr. S. Adler, on the w s of Lexington Ave., 50′ n of One Hundred and Eleventh St.

BUILDING PERMITS.—*Seventy-third St.*, n w cor. Park Ave., 2 five-st'y brick flats, slate and tin roofs; cost, each, $45,000; owner, John N. Stearns, 10 West Fifty-eighth St.; architect, F. Carles Merry; builders, David T. Kennedy and Myran C. Rush.

Tenth Ave., e s, 26′ n One Hundred and Fifty-sixth St., three-st'y frame dwell., tin roof; cost, $6,000; owner, Josephine O'Neill, 270 West Tenth St.; architect, James Neafie; builders, Mansfield Scudder and Fred. Neafie.

One Hundred and Thirtieth St., n s, 225′ w Sixth Ave., 4 three-st'y brown-stone front dwells., tin roofs; cost, each, $12,000; owner, Samuel O. Wright, 103 West One Hundred and Thirtieth St.; architects, Cleverdon & Putzel.

One Hundred and First St., n s, 250′ w Eleventh Ave., three-st'y and basement brown-stone front dwell., slate and tin roof; cost, $12,000; owner, Robert T. Bellchambers, 317 Sixth Ave.; architect, Jos. M. Dunn; builders, W. T. Adams and Molholland & Connelly.

Seventy-first St., n s, 500′ w Eighth Ave., 7 four-st'y brown-stone front dwells., tin roofs; cost, each, $12,000; owner, Owen Donohue, 505 West Fifty-sixth St.; architect, John Sexton.

New Chambers St., Nos. 24-34 *and Rose St., Nos.* 50-58, six-st'y brick store, tin roof; cost, $50,000; owner, Michael Giblin, 125 East Ninety-second St.; architect, Thos. R. Jackson.

Second Ave., s e cor. Sixty-fourth St., 2 two-st'y brick dwells. and stores, tin roofs; cost, each, $3,000; lessees, Chesebro & Whitman, Seventy-ninth St., cor. Second Ave.; architect, R. Rosenstock.

ALTERATIONS.—*Ninth Ave., Nos.* 278 *and* 280, repair damage by fire; cost, $10,000; owner and builder, Hugh Getty, 337 West Twenty-seventh St.

Fifteenth St., Nos. 537 *and* 539, *and* 541 *and* 543, rear two buildings, internal alterations, fitting them up for tenements; cost, $6,000; owner, Jas. Mulry, 30 East Eighty-first St.; architect, Frederick Jenth.

Franklin St., Nos. 86 *and* 88, repair damage by fire; cost, $5,500; owners, Isaac W. How, 31 East Thirty-seventh St., and Wm. P. Draper, 604 Fifth Ave.; architect and builder, Henry Wallace.

Fifth Ave., No. 240, one-st'y brick extension, iron and glass roof, etc.; cost, $10,000; owner, Timothy M. Cheesman, 12 West Twenty-second St.; lessee, Ed. M. Knox; architects, D. & J. Jardine; builders, Chas. T. Wills and W. H. Gedney & Son.

Philadelphia.

BUILDING PERMITS. — *Poplar St., No.* 1508, brick building, 15′ x 33′ 6″; D. N. Bleyler, contractor.

Seventeenth St., s e cor. Fairmount Ave., one-st'y dye-house, 25′ x 92′; two-st'y stable, 20′ x 32′; boiler-house, 16′ x 32′; and addition to main building, 14′ x 14′; Kister & Overn, contractors.

Market St., No. 1011, store extension, 22′ x 26′; Kister & Overn, contractors.

Sixty-third St., cor. Vine St., two-st'y dwell., 20′ x 23′; L. J. Reger & Bro., contractors.

Gransback St., between Indiana Ave. and Cambria Sts., two-st'y dwell., 17′ x 29′; Philip Fitzpatrick, owner.

St. Louis.

BUILDING PERMITS. — Thirty-six permits have been issued since our last report, nine of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows:—

W. Patterson, two-st'y brick dwell.; cost, $5,500.

W. Patterson, two-st'y brick dwell.; cost, $5,500.

John Quinn, two-st'y brick dwell.; cost, $5,000.

Alex. McKechnie, 5 adjacent two-st'y brick stores and dwells.; cost, $8,000; Alex. McKechnie, contractor.

S. D. Porter, two-st'y brick dwell.; cost, $2,500; Eystra & Morrison, contractors.

Mrs. Halstead Burnett, two-st'y brick dwell.; cost, $4,500; J. B. Lindsley & Son, contractors.

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Mrs. Halstead Burnett, two-st'y brick dwell.; cost, $4,500; J. B. Lindsley & Son, contractors.

Hild & Guhman, two-st'y brick dwell.; cost, $5,-600; J. H. McNamara, architect; J. H. Keefe, contractor.

Mrs. L. Riechmann, 2 adjacent two-st'y brick dwells.; cost, $5,000; Bisser Bros., contractors.

Mrs. L. Riechmann, two-st'y brick dwell.; cost, $3,240; Bisser Bros., contractors.

Chas. Bieckel, double two-st'y brick dwell.; cost, $3,500; P. Souerweine, contractor.

St. Paul, Minn.

BUILDING PERMITS. — T. A. Prendergast, two-st'y frame dwell., on Ashland Ave.; architect, A. M. Radcliff; builder, Thos. Fitzpatrick; cost, $4,000.

W. H. H. Johnston, two-st'y frame double dwell., 40′ x 40′, w s of Floral St., bet. Summit and Grand Aves.; cost, $5,000.

Wm. Byrne, two-st'y frame dwell., n s of Martin St., bet. Machubin and Arundel Sts.; cost, $4,000.

Lutheran Church to be built, cor. Wapaska and Tilden Sts.; cost, $30,000.

McAllester Block, to be built bet. Sixth and Seventh Sts., on Jackson St.; cost, $29,000; architect for both the above, Mr. Ulrici.

Washington School, to be built on Eighth St.; cost, $23,000.

Arlington Hill School, to be built; cost, $15,000.

Grand Ave. School, to be built; cost, $2,000; architect for the above 3 buildings, D. W. Millard.

Horace Bigelow, two-st'y frame residence, corner Walnut and Exchange Sts.; architect, Charles T. Mould.

Minnesota Club House, building on cor. Fourth and Cedar Sts.; architect, Chas. T. Mould.

General Notes.

ATHOL, MASS. — R. Brookhouse is building a frame house, costing $5,000; from plans by E. Boyden & Son, Worcester, Mass.

BROCKTON, MASS. — The School Committee urges the erection of a new high-school building.

CLINTON, MASS.—Lyman Leighton is building a frame house and stable, costing $6,500; from plans by Barker & Nourse, Worcester, Mass.

DUDLEY, MASS.—The Trustees of Nichols Academy are building a brick boarding-house, 40′ x 50′; cost, $15,000; E. Boyden & Son, architects, Worcester, Mass.

LAWRENCE, MASS.—The mayor and aldermen have voted not to grant an appropriation of $40,000 for the building of a public library, as recommended by the trustees.

LESTER, MASS.—The Lester Hotel Company is building a frame hotel, three-st'y, 70′ x 80′, costing $25,-000; A. P. Cutting, architect, Worcester, Mass.

OXFORD, MASS.—O. J. Joselyn is building a frame house, costing $15,000; from plans by A. P. Cutting, Worcester, Mass.

SAN FRANCISCO, CAL.—Adolph Sutro, says the San Francisco *Chronicle*, has been quietly at work for a number of years maturing a plan which will place him among the public benefactors of California. He intends to establish a free public library, and to erect a handsome building, and when all is complete to present it to the city.

SPENCER, MASS.—P. J. McDonald is building a frame tenement-house, costing $5,000; E. Boyden & Son, Worcester, Mass., are the architects.

SUTTON, MASS.—A town-hall is being built, 40′ x 60′; cost, $8,000; E. Boyden & Son, architects, Worcester, Mass.

WESTBORO, MASS.—The Methodist Church Society is building a frame parsonage, costing $5,000; from plans by Barker & Nourse, Worcester, Mass.

WORCESTER, MASS.—Walker Armington is about building a block of brick with Sutherland Falls marble finish, 56′ x 126′, five-st'y, containing 35 tenements, and costing $45,000; E. Boyden & Son, architects.

Two brick and brown-stone school-houses, 94′ x 95′, each costing $30,000, are being built cor. Chandler and Gage Sts.

Genery Stevens is building a frame house and stable on London St., costing $6,000.

George S. Clough is about building a frame house cor. Merrick and Austin Sts., costing $8,000.

E. J. Watson is building a cottage and stable on Westminster St., costing $4,000.

Mrs. A. F. Holman is building a frame house on Lancaster St., costing $5,000.

E. E. Carpenter is building a frame house on Brigham St., costing $2,500.

John C. Woodbury is building a frame cottage, costing $2,500.

John L. Parker is building a frame cottage and stable on Newbury St., costing $3,500; Barker & Nourse are architects for 9 houses last mentioned.

Wm. H. Sawyer is building a house of brick and freestone on Lincoln St., costing $30,000.

H. L. Stock is building a frame residence, cor. Main and Hancock Sts., costing $8,000; A. P. Cutting, architect, for last 2 houses mentioned

PROPOSALS.

CANAL LOCK.
[Near Charleston, W. Va.]
UNITED STATES ENGINEER OFFICE,
CHARLESTON (Kanawha Co.), W. VA., Dec. 30, 1884.

Proposals for finishing Lock No. 2, of the Great Kanawha River Improvement will be received at this office **until noon, of February 3, 1885,** and opened immediately thereafter.

Blank forms and specifications can be had upon application at this office.

WM. P. CRAIGHILL,
475 Lt.-Col. of Engineers, U. S. A.

LIMESTONE.
[At Cincinnati, O.]
68 & 69 JOHNSTON BUILDING, CINCINNATI, O.

Sealed proposals will be received at the offices of the undersigned **until noon of Tuesday, the 27th day of January, 1885,** for 5,000 cubic yards of building limestone, for Messrs. Procter & Gamble.

Specifications may be seen and forms of proposal obtained at the offices of the undersigned.

Proposals will be received for all or part of the above quantity, delivered either on the premises, at Ivorydale, Hamilton County, O., or on cars on the Cincinnati, Hamilton & Dayton Railroad.

The right is reserved to reject any or all bids.

ANDERSON & HOBBY,
474 Civil Engineers.

ROLLED-IRON BEAMS AND PLATE GIRDERS.
[At Washington, D. C.]
OFFICE OF BUILDING FOR STATE, WAR AND NAVY DEPARTMENTS,
WASHINGTON, D. C., January 22, 1885.

Separate sealed proposals for furnishing and delivering the rolled-iron beams and sixteen plate girders required for four floors of the west and centre wings of the Building for the State, War and Navy Departments in this city will be received at this office **until 12 M., on February 17, 1885,** and opened immediately thereafter, in presence of bidders.

Specifications, general instructions to bidders, and blank forms of proposal, for either the beams or the girders, will be furnished to established manufacturers on application to this office.

THOS. LINCOLN CASEY,
476 Colonel, Corps of Engineers.

COURT-HOUSE ALTERATIONS.
[At Preston, Minn.]
PRESTON, January 9, 1885.

The County Commissioners of the County of Fillmore, in the State of Minnesota, will receive sealed proposals **until the 25th day of March, 1885, at 12 o'clock, M.,** at the office of the county auditor, in the village of Preston, said county, for the remodeling of the county court-house in said village, and the building of 2 two-st'y brick additions thereto, and iron vaults therein, and the furnishing all materials, in accordance with the plans and specifications therefor on file in the office of said auditor, which can also be seen at the office of Mayberry & Son, architects, Winona, Minnesota.

No bids will be received except for the whole building complete as specified.

The successful bidder will be required to give a sufficient bond with sureties, within a reasonable time to be fixed by said commissioners, in the sum of $15,000, to be approved by said commissioners, conditioned upon the faithful performance of his contract.

Each bid must be accompanied by a sufficient bond with sureties, or a duly certified check payable to said county in a sum of at least five per cent of such bid, conditioned upon the giving the bond above specified within the time so fixed, provided such bid should be accepted. The work will cost several thousand dollars, and must be completed on or before the first day of November, 1885. Right reserved to reject any or all bids.

J. G. MINER,
Chairman Board of County Commissioners.
Attest: G. A. HAYES, County Auditor.
479

COURT-HOUSE.
[At Troy, O.]
AUDITOR'S OFFICE,
TROY, MIAMI CO., O., January 3, 1885.

Sealed proposals will be received at this office **until 12 o'clock, noon, of February 11, 1885,** for furnishing all the material and performing the labor necessary to erect a new court-house at Troy, in said County, according to plans and specifications on file at this office.

Bids must be made according to law, and must be accompanied by a bond (to be approved by the Board of Commissioners) for at least twenty-five per cent of the amount of the bid; the bond to be conditioned that if work is awarded, a proper bond and contract will be entered into.

The Commissioners reserve the right to reject any or all bids.

Blanks for bids and bonds can be had at this office, or at the office of J. W. Yost, architect, at Columbus, O.

Bids must be endorsed "Bid for Court-House," and addressed to HORATIO PEARSON,
474 County Auditor, Troy, O.

PUMPING-ENGINES.
[At Cincinnati, O.]
GLENN BUILDING, ROOM 21,
CINCINNATI, O., January 10, 1885.

The Board of Public Works of the City of Cincinnati will receive proposals **until noon of January 31, 1885,** for the construction, erection and furnishing complete, ready for daily service, of the following machinery:—

Two (2) ten million (10,000,000) gallon high-duty pumping-engines.

The engines will be of the compound, condensing, crank and fly-wheel type: to be erected upon a foundation now partially constructed, and to be finished according to contractors' plans, in the Front St. Pumping-House, Cincinnati. The proposals shall be sealed, and addressed to the Board of Public Works and marked "Proposal for Pumping-Engines."

The successful bidder will be required to deposit with the Clerk of the Board of Public Works $3,000 in cash or U. S. Government Bonds as an earnest of his purpose to carry out his contract, and shall execute a bond with two (2) acceptable sureties, one of whom shall be a resident of Cincinnati, in such sum as may be determined by the Board of Public Works, as a guarantee of his faithful performance of all the conditions of the contract.

One-half of the cash deposit will be returned upon completion of the first engine, and the remainder upon completion of the second engine.

The Board of Public Works reserves the right to reject any or all proposals.

For specifications, forms of proposal and plans of present foundation, address JOHN W. HILL,
Consulting Engineer.
CHARLES DOLL, President,
474 Board of Public Works.

STEEL CASTINGS.
[At New York, N. Y.]
NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR,
WASHINGTON, D. C., January 2, 1885.

Sealed proposals, endorsed "Proposals for Steel Castings," will be received at this Bureau **until 12 o'clock, noon, on Tuesday, February 3, 1885,** when they will be opened in the presence of such bidders as may be present, for the steel castings of the turrets of the United States Steamship "*Miantonomoh*," as stated on requisition No. 108, from the New York Navy Yard, at which yard these castings must be delivered within three months after the contract is made, free of all expense to the Government.

The castings must in all respects conform strictly to the schedule for the same, which accompanies and forms part of the requisition, and will be subjected to a careful examination and inspection at the works, by an officer or officers detailed by the Department for that purpose, before being received.

Copies of the schedule and requisition will be furnished to those who are known to have the necessary facilities for doing the work, upon application to the Commandant of the New York Navy Yard.

The proposals must be accompanied with the guarantee required by law, that if the contract is awarded, it will be promptly executed, and the names of parties who are to become the sureties to the amount of the face of the contract will also be stated.

The Department reserves the right to reject any or all the proposals, as, in its opinion, the public interest requires. T. D. WILSON,
474 Chief of Bureau.

LABOR AND MATERIALS.
[At Greensborough, N. C.]
OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 19, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 24th day of February, 1885,** for all the labor and materials, excavating, etc., concrete foundations, brick, stone and iron work, wood floors, partitions and roof-framing, slate and galvanized-iron work required for the basement and superstructure of the court-house, post-office, etc., at Greensborough, N. C., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
475 Supervising Architect.

GLASS AND ENCAUSTIC FLOOR TILING.
[At Jackson, Miss.]
OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 10, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 31st day of January, 1885,** for furnishing and delivering, ready for setting, all the polished plate, polished plate ground, double-thick sheet, and double-thick sheet ground glass, and for furnishing and laying all the encaustic floor tiling required for the court-house, etc., at Jackson, Miss., in accordance with drawings, specifications, etc., copies of which (for each class) and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
474 Supervising Architect.

GLASS.
[At Kansas City, Mo.]
OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 14, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 2d day of February, 1885,** for furnishing and delivering, ready for setting, all the polished plate and double-thick sheet, and double-thick sheet ground glass required for the custom-house and post-office at Kansas City, Mo., in accordance with specification and schedule, copies of which and any additional information may be had on application at this office, or the office of the local superintendent of the building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
475 Supervising Architect.

GLASS AND ENCAUSTIC FLOOR TILING.
[At Memphis, Tenn.]
OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 10, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 5th day of February, 1885,** for furnishing and delivering, ready for setting, all the polished plate, polished plate ground, double-thick sheet, and double-thick sheet ground glass; and for furnishing and laying all the encaustic floor tiling required for the custom-house, etc., at Memphis, Tenn., in accordance with drawings, specifications, etc., copies of which (for each class) and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
474 Supervising Architect.

LABOR AND MATERIALS.
[At Harrisonburg, Va.]
OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 10, 1885.

Sealed proposals will be received at this office **until 2 o'clock, P. M., on the 24th day of February, 1885,** for furnishing all the labor and materials, including stone, bricks, woodwork, etc., required for the construction of the court-house, etc., building at Harrisonburg, Va., in accordance with drawings and specifications, copies of which, and any additional information may be obtained on application at this office or the office of the superintendent, on and after January 23, 1885.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
474 Supervising Architect.

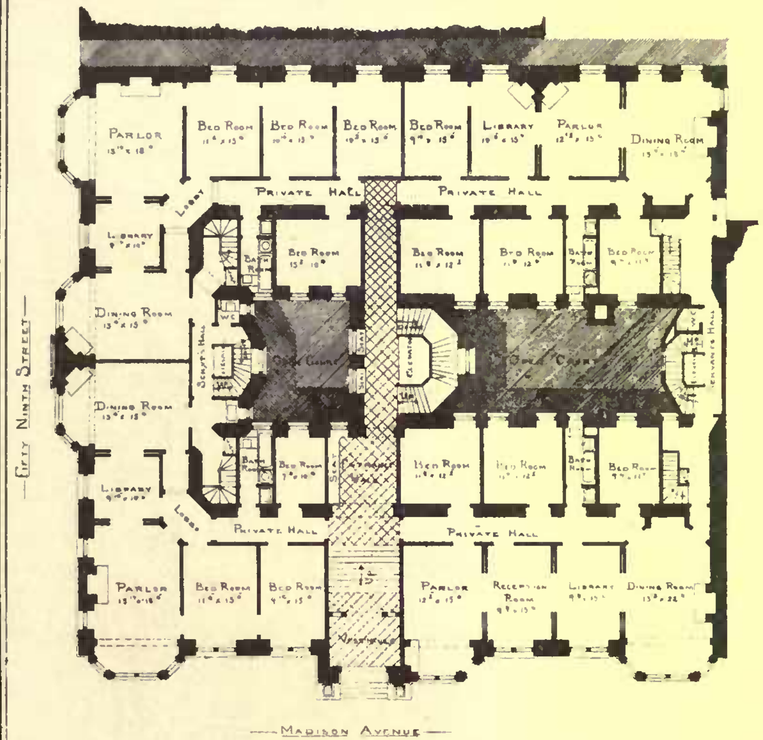
IRON ROOF.
[At Buffalo, N. Y.]
OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 9, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 31st day of January, 1885,** for furnishing and putting in place the iron roof framing for the extension of the custom-house, etc., building, at Buffalo, N. Y., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office, or the office of the superintendent.

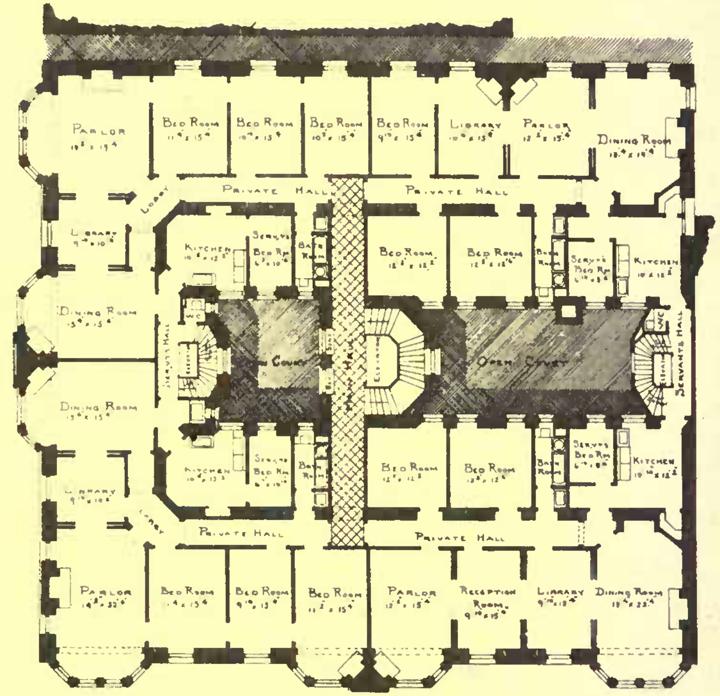
Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
474 Supervising Architect.

CAST-IRON WORK.
[At Washington, D. C.]
OFFICE OF BUILDING FOR STATE,
WAR AND NAVY DEPARTMENTS,
WASHINGTON, D. C., January 8, 1885.

Sealed proposals for furnishing and delivering the cast-iron column and pilasters for four stories of the west and centre wings of the Building for the State, War and Navy Departments in this city, will be received at this office **until 12 M., on January 27, 1885,** and opened immediately thereafter in presence of bidders. Specifications, general instructions to bidders, and blank forms of proposals will be furnished to established manufacturers on application to this office. THOS. LINCOLN CASEY,
474 Col. Corps of Engineers.



—Plan of First Floor—



—Plan of Upper Floors—

"Hoffman Arms" Apartment Building,

Cor. Madison Ave. and 59th St. New York.

Cha. W. Romeyn & Co., Arch'ts.





HELIOTYPE PRINTING CO. BOSTON

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JANUARY 31, 1885.

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CONTENTS.

A DEPLORABLE fire occurred recently in Illinois, by which one of the wards of the Eastern Illinois Insane Asylum, at Kankakee, was totally destroyed, thirteen out of the forty-five patients in the asylum meeting a dreadful death. The fire broke out in the middle of the night, and spread rapidly through the woodwork of the building, filling the whole in a few minutes with fatal smoke. The asylum is half a mile from the town, so that help could not reach it from outside, and, although a few pipes and hydrants had been put in for protecting the wards, the appropriations had not been sufficient to complete the water service, and there was practically no means at hand for checking the flames. It is well known that the insane are very difficult to control in case of fire, which excites and attracts them; and although the officers and attendants worked heroically to save their patients, they could not rescue all. It appears from the evidence given before the coroner's jury that the superintendent of the asylum, Dr. Dewey, had repeatedly called the attention of the Legislature to the unprotected state of the building, but had not succeeded in obtaining the appropriation of a sum adequate for making a change; the Legislature having apparently dismissed the subject with the easy assurance, which we find in the newspaper account, that "it was supposed that every precaution possible had been taken against fire." The character of these "precautions," which were, as we suppose, under the direct charge of the three State Commissioners, may be inferred from the fact, shown by evidence before the coroner, that the top of the hot-air furnace in the basement was only four inches from the underside of the pine floor-beams. This circumstance is quite sufficient to account for the fire, and the only wonder is that it had not occurred before. It seems that the superintendent had asked to have the floors over the furnace changed, but his request was disregarded, and after the joists had become thoroughly dried out, a cold winter's night, with a little urging of the furnace fire, were followed by their natural consequences.

BY the liberality of Mr. Henry Lomb, of Rochester, New York, the American Public Health Association is enabled this year to offer valuable prizes for essays on four subjects of importance to public hygiene. The first subject assigned is that of "Healthy homes and foods for the working classes;" the second is, "The sanitary conditions and necessities of school-houses and school life;" the third is "Disinfection and individual prophylaxis against infectious disease," and the last is, "The preventable causes of disease, injury and death in American manufactories and workshops, and the best means and appliances for preventing and avoiding them." Two prizes are offered for each subject, one of five hundred dollars for the best essay, and one of two hundred dollars for the second in merit. The object particularly sought in inviting these essays is the promotion of original investigation, and the results of intelligent study will receive much higher consideration than laborious compilations from books. Essays intended to compete for prizes must be in the hands of the Secretary of the Association, Dr. Irving A. Watson, Concord, New Hampshire, on or before October 15 next, and awards will be made at the meeting of the Association, in December.

ALLOYS of iron are beginning to play an important part in the industrial world. A year or more ago several processes were introduced for combining iron with a considerable percentage of zinc, giving a white, ductile, and malleable metal, not subject to corrosion, and, one would think, invaluable for the purposes to which tin plate and galvanized iron are now applied. More recently, an alloy of iron, copper, and manganese has been produced, containing about two parts each of copper and manganese to one of iron, which when cast in blocks is perfectly malleable and extremely tough. By adding zinc the alloy can be softened, so as to be capable of rolling into plates of any thickness. Whether an alloy containing so large a proportion of such expensive metals as copper and manganese would ever replace iron is doubtful, but the zinc and iron alloy promises to be of great importance.

A REMARKABLE electric battery, recently invented by Mr. Edward O'Keenan, is described in *Le Génie Civil*. The construction of the battery is very simple, each element consisting of a porous cup, standing in a glass beaker, much like some forms of the Leclanché battery; but the reagents used differ from those employed in the Leclanché battery. The negative pole is naturally of zinc, dipping into a solution of pure sulphuric acid in water, in the proportion of seven parts of acid to one hundred of water. The zinc is amalgamated, to prevent local action; and in order to maintain the amalgamation a small dose of persulphate of mercury is dissolved in the acid bath. The remainder of the battery is formed by filling the porous cup with binoxide of lead, and inserting a cylinder of carbon. The carbon prevents the formation of local circuits in the mass of peroxide of lead, after the deoxidation produced by the action of the battery has gone far enough to reduce a part of the oxide to metallic lead, while it remains itself unchanged, although it appears to contribute a small portion of electric force to that derived from the other reagents. The theory of the battery is simple: the zinc is oxidized and dissolved by the acid, and the oxide of lead is reduced, with so little loss from local circuits that the whole theoretical electro-motive force due to the chemical combination is said to be delivered at the poles of the battery until the action is interfered with by polarization, which finally cuts off about one-third of the force of the current. After the battery becomes inactive, through the solution of the zinc, or the reduction of the oxide of lead, which may take place in a year or two, instead of being thrown away, or the chemicals renewed, a current from a dynamo-electric machine is passed through it for a certain length of time, in a direction opposite to that of the battery itself. Under the influence of this current the battery is gradually reconstituted. The sulphate of zinc dissolved in the acid liquid is decomposed, precipitating metallic zinc on what remains of the cylinder or plate which formed the negative pole, and reviving pure sulphuric acid in the bath; while the metallic lead in the porous cup absorbs the oxygen set free from the zinc sulphate, becoming reconverted into peroxide, which, as soon as the operation is finished, is ready to work with its original energy for another year.

THE island of Delos has long been one of the most interesting portions of the world for the archæologist; not that the remains of antiquity which exist there are particularly important, but because the island, as the most sacred portion of Greece, the sanctuary of Apollo and Diana, occupied a position in the ancient world which must have given to the life of its inhabitants, and to the ceremonies performed in its temples, a character differing from anything known elsewhere. History tells us marvellous stories of the purity which reigned throughout the island. No dog was ever allowed to enter it, and no death was permitted to take place upon it, all persons suffering from fatal disease being carried, under strict laws, to the neighboring island of Rhané, that the birth-place of the sun and the moon might not be profaned by mortal weakness. Although the sanctity of the place was so great that even the barbarians respected it, and in all the wars between the Greeks and the Persians it was never invaded, the buildings which once stood there have almost completely disappeared, and nothing is left but the foundations of the temples. One of these has just been excavated by a French expedition, and

presents a very singular plan, the pronaos and the cella, or sanctuary, being separated by a long gallery, having a walk all around it, at the level of the floor of the remaining portions of the temple, and a large sunken space within. It is known that a famous altar existed at Delos, made, according to the tradition, of the horns of the goats or stags killed by Diana upon Mount Cynthus, the highest portion of the island; and it is suggested that the sanctuary of the temple may have been the place of this altar, and that the long gallery which precedes it may have been built for the sacred dances which, as is known, took place before the altar of horns. In this case, the dancers occupied the sunken central space; while the spectators looked on from the surrounding platform.

A METHOD of determining the thickness of the iron plates in boilers or tanks, without cutting the plate, is described in *Le Génie Civil*. Although the process is rather rude as yet, the theory on which it rests is a most ingenious one, and the principle is capable of being applied to a very extended range of similar tests. M. Lebasteur, the engineer of the great French railway company Paris-Lyons-Mediterranean, deserves to have his name remembered as the inventor of the process, which in his hands has given results of singular accuracy. To test the thickness of a particular boiler-plate, or portion of a plate, M. Lebasteur spreads on the plate which he wishes to examine a spot of tallow, about one one-hundredth of an inch thick, and makes a similar application to a bit of sheet-iron of known thickness. He then applies to each, during a certain time, a small object, heated to a point as nearly constant as possible; using generally for the purpose one of the little cauterizing instruments made for surgical purposes. On the application of the hot instrument the tallow melts, forming a circle of bare metal around the heated point, bounded, after the place has cooled, by a little ring of tallow, raised above the surrounding portions. If the cautery has been applied for the same length of time to each plate, the diameters of the little melted circles upon the two plates will be to each other inversely as the thickness of the plates. The explanation of this of course is that in the thicker plate the heat of the cauterizing tool is conducted away so rapidly by the larger mass of metal that a small portion only is made hot enough to melt the tallow on it; while in the thin plate the heat is less freely diffused, and the effect extends laterally to a greater distance. Some variation in the results would probably come from the different chemical composition of plates tested, but it is worth noting that the direction of the fibres in the plates seems to have no influence whatever on the melting of the tallow.

IT is interesting to observe that in France, that home of new social ideas, the better class of architects have of late years taken an important part in the movements which seek to improve the relations between workingmen and their employers. In the great strikes among the building trades which took place in Paris not long ago the Société Centrale, the great French professional association, was appealed to frequently, both by the masters and the men, and its influence undoubtedly did much to promote the settlement of those deplorable disputes. Although connected more directly with the employers than their workmen, it has been common with French architects, ever since the time of Viollet-le-Duc, and perhaps longer, to interest themselves in individual men whom they observe to be particularly skilful or intelligent; and for some time the Société Centrale has annually awarded medals to meritorious journeymen in all the building trades. This example of interest and good feeling seems to have encouraged similar sentiments among the master-builders, and a few days ago a number of architects, besides all the principal officers of the Société Centrale, were invited to participate in the presentation of medals, given by the various associations of master-builders and mechanics to the workmen who had most distinguished themselves by long and faithful service. The ceremony was dignified by the presence of the Minister of the Interior, M. Waldeck-Rousseau, who explained the official view of the labor question in an excellent speech, and presented, on behalf of the Government, an additional medal to the workman most distinguished in the award of the masters' recompenses, announcing at the same time the nomination of the president of the masters' association, M. Bertrand, as a chevalier of the Legion of Honor. The veteran among the workmen, who received both the masters' and the Government medal, was M. Asseline, who had been sixty-five years in the service of a certain firm of painters and glaziers; while another medallist, M. Chardin, had been engaged fifty-two years in the shop of M. Gay, a joiner. The presentation of the medals was followed by a dinner at the Continental, of which three hundred and thirty masters and men partook, under the presidency of the Prefect of the Seine, and sentiments of regard and concord were expressed, by the delegates of the trades-unions as well as the masters, which, it is to be hoped, will not be forgotten when the next difference of opinion arises between them.

THE economical manufacturers and railway engineers of France and Germany have long made use of the dust and refuse of coal mines by mixing it with tar and compressing it into cakes, which are sold at a low price, and when well made answer every purpose to which coal in lumps is applied. *Le Génie Civil* gives an account of a new machine for manufacturing these coal-dust cakes, together with statistics of the cost of the process which are quite interesting. The most important peculiarity of the new machine consists in its appliances for keeping the coal-dust hot while it is mixed with the tar and pressed into moulds. In the ordinary process the coal-dust and tar are put together into a sort of mortar-mill, and the mixture is carried from this to the moulding-machines; but moisture, if not originally present in the dust, often is in the mill, and interferes seriously with the cohesion of the particles; so that the improved machine not only saves the labor of handling and transportation from the mortar-mill to the moulding-press, but secures by its heating devices the expulsion of all moisture, and economizes tar through the incipient softening of the bituminous portions of the coal. After the mixture of coal and tar is ready, it passes immediately into another part of the machine, where it is subjected to a double compression, which forms it into hard, brick-shaped lumps, weighing three pounds each, but moulded with grooves on each face, to facilitate the breaking of the lumps if that should be necessary. The operation of a single machine, set up in a factory by itself, requires the attention of a foreman, two firemen, two laborers, who supply coal-dust and tar, and four boys to load the bricks on cars, or pile them in storage sheds; and the cost, for labor alone, is, in France, ten cents per ton of completed bricks. The coal required for heating the dust and tar costs at most, even where the dust is very damp, eight cents a ton; so that, even with an allowance of twenty per cent additional for contingencies, the cost of the product, exclusive of that of the coal-dust and tar, is twenty-two cents a ton. In most mining districts, coal-dust is a waste product, which can be had for nothing by any one who will carry it away, and tar, in soft coal districts, is not of much greater value; so that there would seem to be a prospect of considerable profit in the establishment of a similar manufacture in many parts of our own country.

THE story of the fraud said to be practised by certain Sheffield manufacturers, in selling Bessemer or Siemens-Martin steel under the name of cast steel, which has hitherto been appropriated to blistered steel, cast in crucibles, and worth five times as much as the Bessemer steel, is partly explained by one of the Sheffield journals, which says that tool steel is made by the Sheffield manufacturers of blistered steel and Bessemer or Siemens-Martin steel melted together in different proportions, according to the use which is to be made of the metal. Spring steel, for instance, is made of nearly equal parts of Bessemer and crucible steel, while razors and files contain from two to three parts of crucible steel to one of the inferior metal; and shears and agricultural implements are nearly all Bessemer steel. There is no objection, certainly, to mixing the two qualities of steel in such proportions as may be found to give the qualities desired for making tools at a lessened expense, but even if the mixture were better than the best blistered steel, there would be fraud in calling it by a name intended to deceive the purchaser into supposing that he was buying a more costly, even if inferior product. Unfortunately, however, it rarely happens that business competition leads to improvement in the quality of goods at the same time that it reduces their cost; and consumers of cutlery who have found the mark "Warranted Cast Steel," to mean one thing on Sheffield goods, and something else on those from other places, will be likely to confine their dealings to those manufacturers whose expressions they can understand.

STATUES AND MONUMENTS OF LONDON.[1] — I.



Lord Derby, Parliament Square, 1864. Noble, Sculptor.

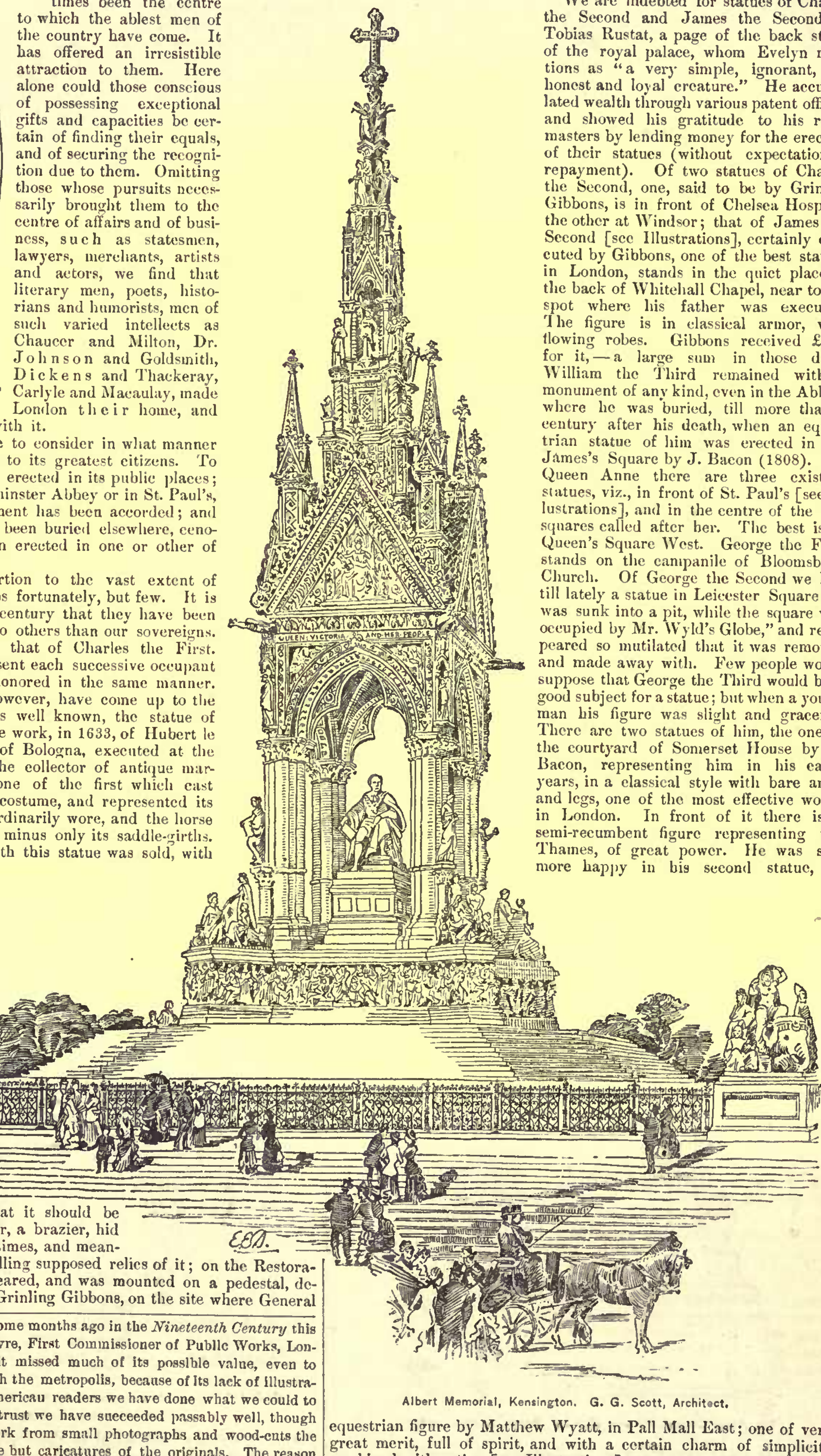
LONDON, the metropolis of wealth and fashion, has also from the earliest times been the centre to which the ablest men of the country have come. It has offered an irresistible attraction to them. Here alone could those conscious of possessing exceptional gifts and capacities be certain of finding their equals, and of securing the recognition due to them. Omitting those whose pursuits necessarily brought them to the centre of affairs and of business, such as statesmen, lawyers, merchants, artists and actors, we find that literary men, poets, historians and humorists, men of such varied intellects as Chaucer and Milton, Dr. Johnson and Goldsmith, Dickens and Thackeray, Carlyle and Macaulay, made London their home, and identified their names with it.

It may be worth while to consider in what manner London has done honor to its greatest citizens. To some, statues have been erected in its public places; to others, burial in Westminster Abbey or in St. Paul's, with or without a monument has been accorded; and to some, again, who have been buried elsewhere, cenotaphs or busts have been erected in one or other of these great fanes.

Of statues, in proportion to the vast extent of London, we have, perhaps fortunately, but few. It is only within the present century that they have been erected in the open air to others than our sovereigns. The earliest statue was that of Charles the First. From his time to the present each successive occupant of the throne has been honored in the same manner. Few of these statues, however, have come up to the level of the first. As is well known, the statue of Charles the First was the work, in 1633, of Hubert le Sueur, a pupil of John of Bologna, executed at the cost of Lord Arundel, the collector of antique marbles. It was probably one of the first which cast aside armor or classical costume, and represented its subject in the dress he ordinarily wore, and the horse with its usual caparison, minus only its saddle-girths. During the Commonwealth this statue was sold, with the express condition that it should be broken up. Its purchaser, a brazier, hid the statue against better times, and meanwhile made a profit by selling supposed relics of it; on the Restoration the statue again appeared, and was mounted on a pedestal, designed by the celebrated Grinling Gibbons, on the site where General Harrison and four other regicides were hanged. The statue has great merit; it is worthy of its position and subject, reminding one not a little, from some points of view, of Vandyke's portraits of the King.

We are indebted for statues of Charles the Second and James the Second to Tobias Rustat, a page of the back stairs of the royal palace, whom Evelyn mentions as "a very simple, ignorant, but honest and loyal creature." He accumulated wealth through various patent offices, and showed his gratitude to his royal masters by lending money for the erection of their statues (without expectation of repayment). Of two statues of Charles the Second, one, said to be by Grinling Gibbons, is in front of Chelsea Hospital, the other at Windsor; that of James the Second [see Illustrations], certainly executed by Gibbons, one of the best statues in London, stands in the quiet place at the back of Whitehall Chapel, near to the spot where his father was executed. The figure is in classical armor, with flowing robes. Gibbons received £500 for it, — a large sum in those days. William the Third remained without monument of any kind, even in the Abbey, where he was buried, till more than a century after his death, when an equestrian statue of him was erected in St. James's Square by J. Bacon (1808). Of Queen Anne there are three existing statues, viz., in front of St. Paul's [see Illustrations], and in the centre of the two squares called after her. The best is in Queen's Square West. George the First stands on the campanile of Bloomsbury Church. Of George the Second we had till lately a statue in Leicester Square: it was sunk into a pit, while the square was occupied by Mr. Wyld's Globe," and reappeared so mutilated that it was removed and made away with. Few people would suppose that George the Third would be a good subject for a statue; but when a young man his figure was slight and graceful. There are two statues of him, the one in the courtyard of Somerset House by J. Bacon, representing him in his early years, in a classical style with bare arms and legs, one of the most effective works in London. In front of it there is a semi-recumbent figure representing the Thames, of great power. He was still more happy in his second statue, an equestrian figure by Matthew Wyatt, in Pall Mall East; one of very great merit, full of spirit, and with a certain charm of simplicity combined with action [see Illustrations].

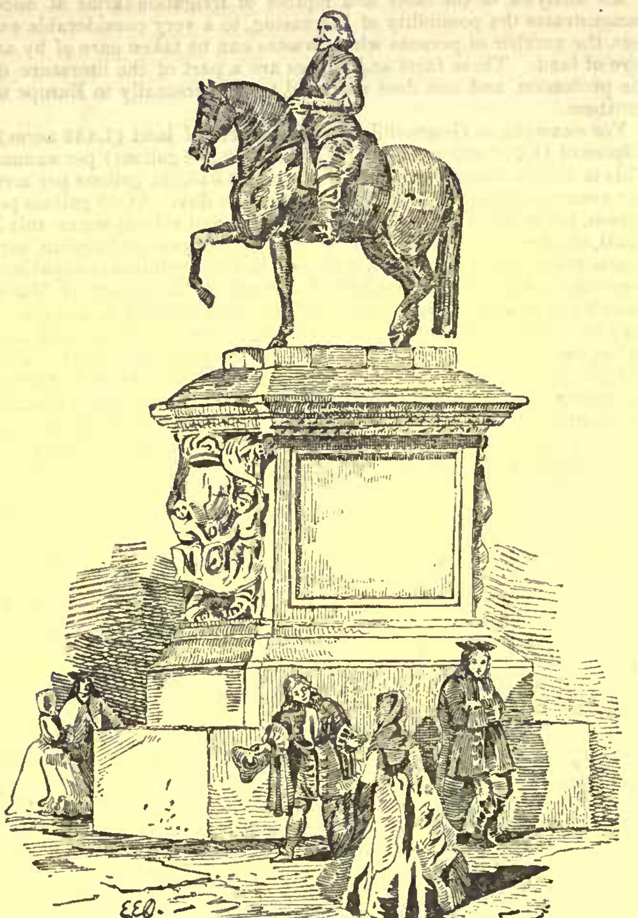
The statue of George the Fourth by Chantrey, an equestrian figure of much nobility, was intended to surmount the Marble Arch, when



Albert Memorial, Kensington. G. G. Scott, Architect.

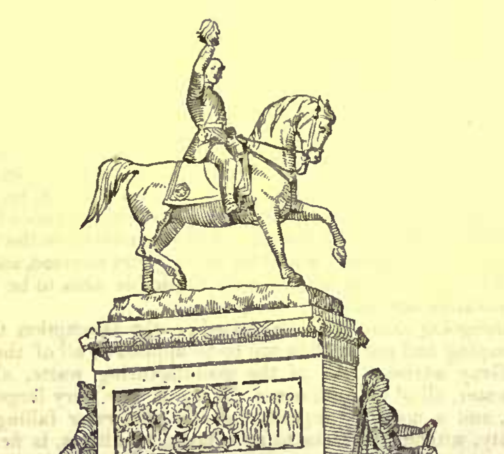
[1] [When we encountered some months ago in the *Nineteenth Century* this paper by Mr. G. Shaw Lefevre, First Commissioner of Public Works, London, it seemed to us that it missed much of its possible value, even to English readers familiar with the metropolis, because of its lack of illustration. In the interest of American readers we have done what we could to supply the deficiency, and trust we have succeeded passably well, though as we have often had to work from small photographs and wood-cuts the results may in some cases be but caricatures of the originals. The reason that all statues here mentioned are not illustrated is simply that our agent after long search was unable to procure the necessary views.— Eds. American Architect.]

in front of Buckingham Palace, but has found a place on one of the pedestals in front of the National Gallery [see Illustrations], and so far no fitting companion has been found for the correspond-



Charles I, Charing Cross, 1633. Hubert le Sueur, Sculptor. Pedestal by Grinling Gibbons.

ing pedestal. The statues of William the Fourth in Cannon Street and of Queen Victoria in the Royal Exchange require no comments. Of other royal personages we have the Duke of York by Westmacott, in 1836, on the top of the hideous column in Pall Mall [see Illustrations], far removed from his creditors, as the wits



The Prince Consort, Holborn Viaduct. Bacon, Sculptor, 1873.

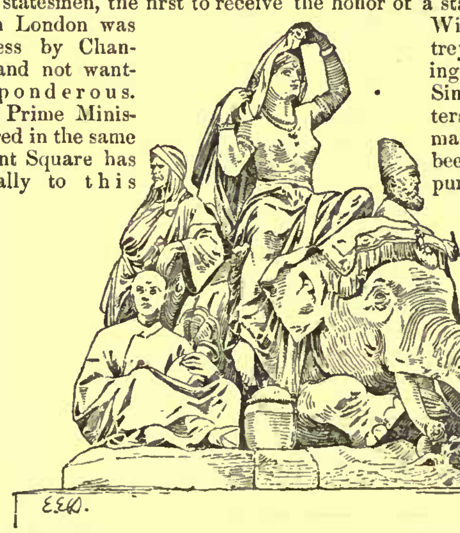
of the day said; the Duke of Cumberland, an equestrian statue of the worst style in Cavendish Square by Cheere; the Duke of Kent by Gagahan, in Portland Place; an equestrian statue of the late Prince Consort by Bacon in 1873, on the Holborn Viaduct, and the gilded statue of the same Prince under the gorgeous canopy opposite to the Albert Hall. It is the fashion in some quarters to depreciate this memorial, but there is unquestionably much work of the greatest merit about it. The frieze round the base with figures in high relief, and the groups of statuary representing the four continents, and especially that of Asia by Foley, are very good. The Prince's figure, also by Foley, is not one of that sculptor's most successful works, and unfortunately an avenue has been laid out



"America." Albert Memorial, Kensington.

leading to the back of the statue, which is its least favorable aspect. There is certainly no monument of modern times which excites more interest, or which gives so much pleasure to the public.

Of statesmen, the first to receive the honor of a statue in the open air in London was William Pitt. His likeness by Chantrey is a striking one and not wanting in dignity, but too ponderous. Since his time four other Prime Ministers have been honored in the same manner, and Parliament Square has been devoted specially to this purpose. Statues



"Asia." Foley, Sculptor. Albert Memorial, Kensington.

of Canning by Westmacott, of Peel by Behnes [see Illustrations], of Palmerston and Lord Derby, and lastly and very lately, of Lord Beaconsfield by Raggi [see Illustrations], have been erected there. There remain places for two more on this sacred spot; one of these must necessarily be reserved for the only living man who was



"Musical Composers." Armstead, Sculptor. From the Podium of the Albert Memorial, Kensington.

the contemporary and equal of those already there. It is to be regretted that a statue of Lord Russell has not been also erected here in place of the marble statue in the Central Hall of Westminster. It would complete the group of statesmen of the era. Of the

statues, those of Derby and Palmerston are inferior and vulgar; by far the best is the most recent, that of Lord Beaconsfield; it is a statue of the greatest merit, a striking likeness, and with that expression, inscrutable and slightly cynical, so well known to those who sat opposite to him in the House of Commons. It is with satisfaction that I look back to having selected this site for it, after consultation with Sir Stafford Northcote, and that it fell to my duty to



William Pitt, Hanover Square. Chantrey, Sculptor.



Robert Peel, Cheapside. Behnes, Sculptor.

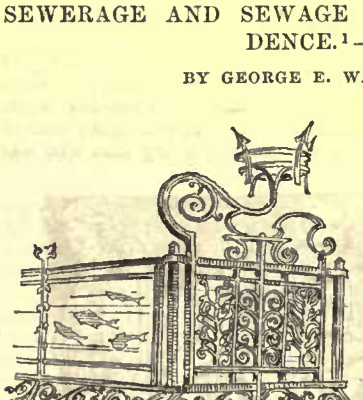
take over the statue on the part of the Commissioners of Works at the ceremony of its unveiling. Looking down on the vast assembly on that occasion, with its expression of lofty unconcern, the statue seemed to invite as an inscription the well-known lines: —

Virtus, repulsæ nescia sordidæ;
Intaminatis fulget honoribus,
Nec sumit aut ponit secures
Arbitrio popularis auræ.
Hor. *Od.* iii. 2. 17.

There is also another statue of Peel by Behnes in Cheapside, and within the last month a statue has been erected to Mr. Gladstone by Joy, in Walbrook [see Illustrations]. It should also be mentioned that there are statues by Westmacott of Charles Fox (1814) in Bloomsbury Square — a figure most inappropriately represented in Roman costume, with bare arms and seated, and in other respects without a redeeming quality — of a Duke of Bedford in Russell Square, and of Lord William Bentinck, by Campbell, in Cavendish Square.

SEWERAGE AND SEWAGE DISPOSAL AT PROVIDENCE.[1] — II.

BY GEORGE E. WARING, JR.



Aquarium Frame. Wro't Iron. Modern.
From Moniteur des Architectes.

THE claims of the chemical processes of purification have been restated, and fairly set forth in the report. The same can hardly be said of its treatment of the irrigation alternative, where it would have been prudent to go a little deeper than to the mere reports of local engineers and sewage farmers. The general result of the foreign works reported on being taken as a basis, it is assumed, without question, that one acre of irrigation area is required for each 100 of the population, or, for a population of 300,000, 3,000 acres of irrigation area.

There are several things to be considered in this connection: In the first place, a very large proportion of the storm-water falling on the surface of the town, frequently reported as "all," flows to the irrigation-field, and provision must be made for taking care of it, in spite of the fact that during heavy rains the irrigation-area is already saturated by the same storm that increases the flow of the sewage. Another is, that in many cases the amount of land used is greater than is now needed, provision having been made for the future growth of tributary population, often because the effort is made to derive a profit from the irrigation, for which end the oversaturation of the land even during storms must so far as possible be avoided.

An analysis of the facts and figures of irrigation-farms at once demonstrates the possibility of increasing, to a very considerable extent, the number of persons whose wastes can be taken care of by an acre of land. These facts and figures are a part of the literature of the profession, and one does not need to go personally to Europe to get them.

For example, at Gennevilliers 600 hectares of land (1.482 acres), dispose of 18,000,000 cubic metres (4,950,000,000 gallons) per annum. This is 30,000 cubic metres per hectare or 3,340,081 gallons per acre per annum, that is 9,151 gallons per acre per day. At 60 gallons per person, being Mr. Gray's estimate of sewage and subsoil water, this is equal to over 150 persons per acre. We happen to have an incidental reference indicating that the soil at Gennevilliers is capable of receiving a much larger amount of sewage, in the report of Marie-Davy's experiment with a large artificial area drained at a depth of six feet. This was covered with growing crops, and it received sewage at the rate of 48,000 cubic metres per hectare per annum. During the six months of the experiment, 24,000 cubic metres of sewage per hectare being applied, only 1,600 cubic metres per hectare reached the drains six feet below the surface. The rest was evaporated by the land and by the crops. This shows that a much larger dose might have been applied. What was applied was equal to 12,576,000 gallons per hectare, or 5,093,117 gallons per acre per annum, being 13,-953 gallons per day, giving at 60 gallons per person 232 persons per acre. This can be exceeded.

Mr. Pontzen says, in his report on the sewerage of Havre, "Experience at Gennevilliers has demonstrated that on permeable lands, the yearly irrigation may reach even to 100,000 cubic metres per hectare."

By the calculation above made, this would give 487 persons per acre.

It is to be borne in mind, however, that the use of sewage at Gennevilliers is entirely at the discretion of the landholders; they use what they want and as they want it. The work is therefore controlled from the agricultural, and not at all from the purification standpoint.

Dr. Frankland, in his experiments on the filtering power of soils with reference to sewage, found that one acre of suitable land devoted to purification without reference to the agricultural result, would dispose of the sewage of 3,300 persons, and Bailey Denton considers it entirely safe to depend upon one-third of this capacity, apportioning the land where purification is the chief object at the rate of 1,100 persons per acre.

All of this shows that it would not be imprudent with a porous subsoil suitably drained to depend on an acre of land to dispose of the sewage of at least 800 persons, being less than one-fourth of Dr. Frankland's limit. This would reduce the area required by Providence after its population shall have reached 300,000 to 375 acres. Therefore it would seem that Mr. Gray had discarded the comparatively inexpensive and perfectly efficient method of irrigation and adopted the very costly and less efficient one of chemical treatment without a full apprehension of present knowledge on the subject. With irrigation, the effluent would reach a high degree of purity; with chemical treatment the purification would probably be sufficient to allow the sewage to be delivered into the river without causing annoyance to the people. Whether or not the delivery of the large amount of chemicals necessarily carried in solution in the effluent, and subjected to the action of the salt sea-water would have an unfavorable effect on the fish and shell-fish of the waters can only be conjectured. Mr. Gray gives us no light on this subject, for he does not tell us which of the many chemical systems he proposes to use.

Were irrigation adopted, the area of land available on the Seekonk Plains (about 1,000 acres) would for many years to come, and doubtless for all time to come, allow nearly the whole area to be devoted to remunerative agriculture.

The foregoing calculations are based on the assumption that artificial pumping and purification are to be applied to all of the sewage as Mr. Gray advises. All of the manufacturing waste, all of the subsoil-water, all of the rain-water falling on one very large area of the city, and a notable proportion of the rain-water falling on the whole city, without reference to its original condition, is first of all to be made equally foul, then all is to be pumped and all is to be purified.

Is this necessary? If not necessary, is it good engineering or good economy to provide for it? It looks like a sacrifice of public money in the interest of the professional reputation of one who either has failed to acquire the convictions which full knowledge of the subject must create, or has not the courage that such convictions should give.

Mr. Gray has spoken favorably of the separate system of sewerage, as most engineers speak favorably of it in the abstract. That part of his report which I have italicized would seem conclusive. It is not worth while here to enter into a discussion of the merits or demerits of this system. The report itself accepts it for portions of Providence. Let us see what, if it were applied to the whole city, would be its effect on the serious problem now in hand. Much of the existing system of sewers could be converted into separate sewers without difficulty, and in the construction of the sewerage for the rest of the city the cost would average surely less than half of the cost of combined sewers for the same district.

[1] *Proposed plan of a Sewerage System and for the Disposal of the Sewage of the City of Providence, R. I.*, by Samuel M. Gray, City Engineer. City Document, No. 25, 1884. Continued from page 45, No. 474.

While many difficult questions would arise as to the disposal of factory waste, street dirt, etc., which are too long to consider here, no one familiar with the business of town sewerage will dispute the proposition that it is practicable to collect all of the filth of the city, which cannot be conveniently removed otherwise, into a system of separate sewers. This being done, the chief factor of the problem is changed from 58,000,000 to 18,000,000, the capacity of the intercepting sewers and of the pumps being reduced by 70 per cent. By leaving the subsoil-water out of the account we should probably lower the chief factor to 12,000,000, and reduce the intercepting and pumping works by nearly 80 per cent. After such reduction let us again consider the alternative methods of disposal, whether by irrigation or by chemical treatment. Naturally, the cost of chemical treatment would be reduced measurably in proportion to the amount of sewage to be treated. On the other hand, the tax to be imposed on the purifying power of the soil would be very much lessened.

Assuming that there is on the Seekonk Plains 1,000 acres of land available, the entire flow of 18,000,000 gallons per day, could it be evenly distributed over this 1,000 acres, would amount to less than two quarts per square feet of the whole area. The voids of a cubic foot of sand amount to more than two gallons, so that 18,000,000 gallons of sewage evenly distributed over 1,000 acres of sandy land would not saturate it three inches deep. It may be saturated three feet deep — intermittently — without disadvantage.

There exists no precedent, and there is no rule for determining exactly how large a population can be provided for on an acre of land, if the waters are collected by a strictly separate system, no storm-water and no subsoil-water being admitted. The real tax on the soil is not in disposing of the organic constituents of the sewage, that which the population has added to it, but in getting rid of the water so as to leave its purifying agencies room to act on the filth, it would surely be perfectly safe to say that with 1,000 acres of land available, as on Seekonk Plain, arranged for intermittent delivery onto different areas, only one-third of the whole being in use in any given week or month, 18,000,000 gallons of sewage, containing the wastes produced by a population of 300,000 would be perfectly disposed of with very little interference with profitable agriculture, leaving a fair chance that the irrigation-farm would be able to pay a good part if not the whole of the cost of pumping. The case would be still better with the subsoil-water excluded.

The question whether or not it is premature to provide permanent works for a population so large as 300,000 can be answered better in the community to which it relates than elsewhere. All that it is worth while to say here is that so far as the limit of population can be reduced, in just so far may the cost of disposal by either system and the cost of the construction of permanent works be reduced also.

The data are not at hand on which to base an estimate of the cost of separate sewerage works and irrigation-disposal works to be contrasted with the estimate given by Mr. Gray. This, however, may be stated definitely: The separate system is especially applicable to Providence, where there is generally a short and easy means for getting rid of storm-water. If properly applied there to the sewerage of a community of 300,000, with sufficient storm-water sewers, it would not cost in original construction so much as one-half the cost of the combined system. Its total outflow instead of being 58,000,000 gallons per day, would surely not exceed 18,000,000 gallons per day, all surface-water and subsoil-water being excluded. It would probably be more nearly 12,000,000. This volume of sewage, bearing the filth that it would, could be satisfactorily and economically purified by irrigation.

If the people of Providence are prudent they will investigate this matter very thoroughly before committing themselves to the enormous expenditure contemplated in the report under consideration.

As a rough estimate, hardly even that, but only a shrewd guess, these figures will probably be safe to put in contrast with the $6,891,-772 required to construct and maintain the works that Mr. Gray proposes: —

Probably when their adjacent property is fully occupied, along the 50 miles of sewers now built, the population will be 100,000; for the remaining 200,000, by the same token, 100 miles of sewers would be needed. Combined sewers would cost probably over $20,000 per mile. This would add over $2,000,000 to the grand total, and make it in round numbers say $9,000,000.

The figures for a separate system with irrigation works would not exceed the following: —

Arranging to exclude storm-water from the present lateral sewers, say 40 miles at $2,500	$100,000
Mains to connect these, say 10 miles at $10,000	100,000
100 miles separate sewers with flush-tanks and subsoil drains at $7,500	750,000
20 miles storm-water sewers (following the straightest course to the rivers), at $10,000	200,000
Pumps and buildings	100,000
5 miles force-main and sewer to irrigation-area at $50,000	250,000
1,000 acres, prepared for use, at $1,000	1,000,000
Capitalization of pumping, 12,000,000 gallons, say $8,000 per year (at 4 per cent)	200,000
	$2,700,000

These are very liberal figures, ample to cover all contingent expenses, and leave the completely equipped sewage-farm* free of all charge, though it could probably be made to earn one-half if not all of the pumping outlay.

This comparative estimate is of course only offered by way of illustration. Mr. Gray might show that the extension of the combined system would cost less than $20,000 per mile; but on the other hand it is altogether probable that an exact, careful estimate of the whole cost of the alternative work proposed would be less than $2,700,000.

It is quite possible that a careful study of the whole subject might show controlling advantages in the use of the combined system in certain parts of the city, if not in all of it; it is possible that difficulties not here considered might prevent the considerable use of the separate system; it is possible too, that there would be difficulties not apparent without a study on the ground why irrigation would not answer the purpose and why chemical treatment must be resorted to.

These points are not intended to be covered in this review. What is intended is to emphasize the principle that engineers in their public utterances on questions of the importance and magnitude of the one under consideration, where enormous outlay is at stake, and where the permanent interests of a great community are involved, should pay sufficient respect to the intelligence and discretion of their readers to set forth *all* of the controlling facts in the clearest way, and that they should in making their recommendations follow the deductions which flow naturally from their premises as stated.

THE ILLUSTRATIONS.

THE STATE CAPITOL, HARTFORD, CONN. MR. R. M. UPJOHN, ARCHITECT, NEW YORK, N. Y.

THE building is built of marble and is made fire-proof: except where groined arches are used; it has iron and brick for floors and ceilings. The building fronts north and south for main fronts; is 296 feet long, and 199 feet deep. Height to top of roof 99 feet; to top of figure on dome 256 feet.

Over the entrances on the main fronts of the major parts of building, the walls are supported by richly moulded and crocketted arches resting on carved capitals of marble, which are 25 feet around abacus, and these are supported on monolithic polished granite shafts, 3 feet 4 inches in diameter. The tympana of these arches are filled with marble — fields for sculpture illustrative of the history of the State; on one is cut the Charter Oak. Above the arches to the sills of the second-story windows, the wall is richly diapered, beneath them and running entirely around the building is a belt-course, also diapered.

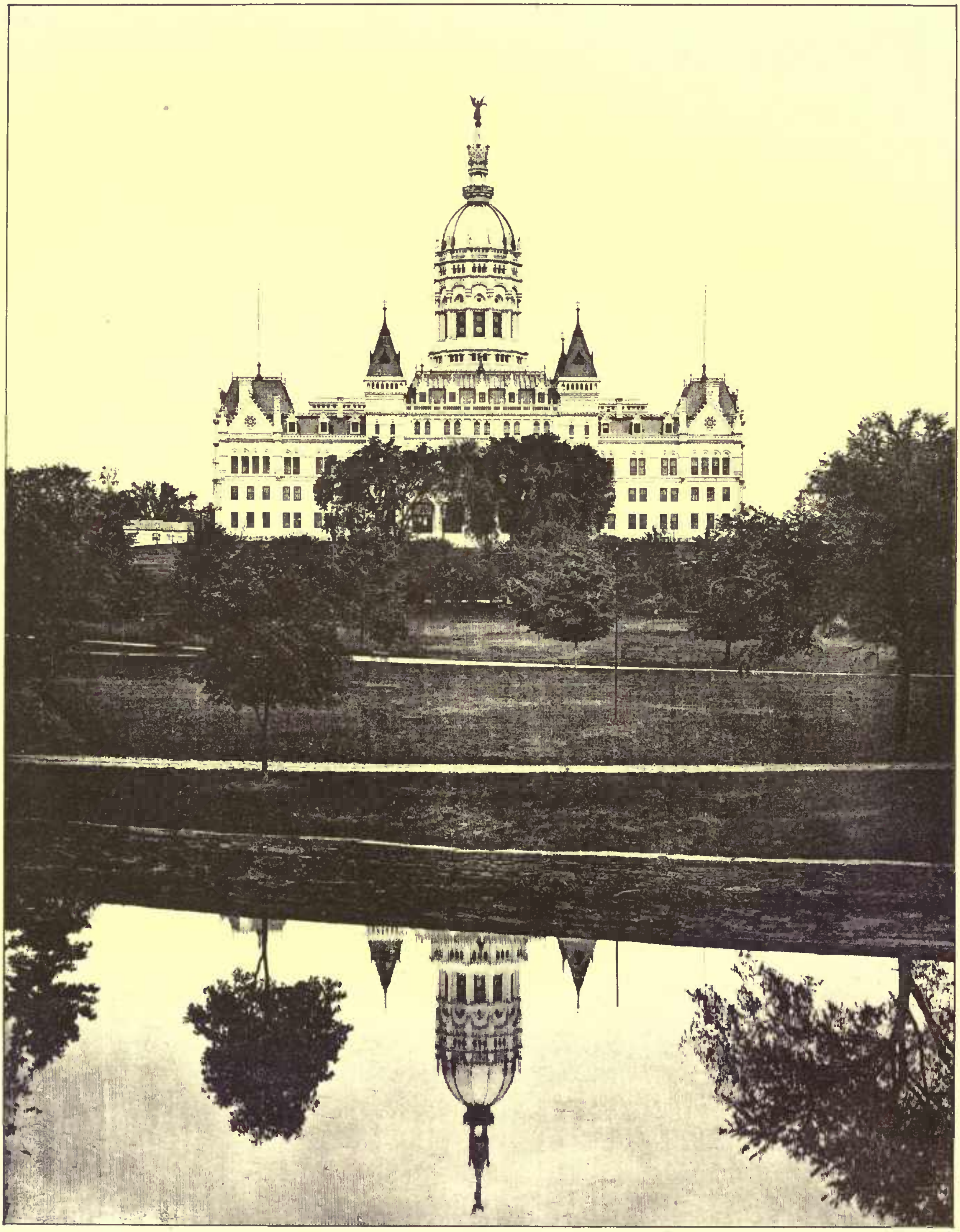
It is intended that sculpture should form an important feature in the architecture of this building. There is a provision for twenty-eight statues, the canopies and pedestals, supported by richly-carved capitals, and the polished granite shafts and carved corbels are already in place. Two of these have statues upon them, one of Jonathan Trumbull, and the other Roger Sherman. Besides these there are fifty-six bust panels, but only two have been occupied, one by Horace Bushnell the other by Noah Webster. The piers supporting the dome are of granite and brick: they are grouped together and for capitals have a continuous abacus which measures for each 288 feet. On this construction rests the dome, which is a dodecagon. The cupola which is entirely of marble is supported on a brick cone. The platform is 18 feet in diameter; around the drum of the dome are galleries for ascent, which are built in the thickness of the wall, parts of the walls are 12 feet thick; in the interior there is a whispering gallery. The pinnacles at the angles of the dome have for terminals marble statues by Ward; they represent Science, Agriculture, Art, etc. The staircases are a remarkable feature in this building. The platforms and landings are of granite; the balustrades with granite shafts and carved-marble caps and bases. There are forty-six polished granite shafts on the staircases. The entrances on the north and east fronts are through open vestibules, at the second arcades are the doors. The northern entrance is into a hall 28 feet high, and 42 feet x 55 feet, with a groined ceiling in brick, rising from piers and polished granite columns and centrally from coupled shafts with foliated capitals of marble and carved bases. The southern entrance is intended for a carriage entrance, and they pass through a colonnade about 90 feet long. The Senate Chamber is 50 feet x 40 feet, with a coffered ceiling 35 feet high. The galleries are on each end of the room; the wainscoting and finish are of oak; on either side of this chamber are rooms for the different State officers, those nearest are 26 feet x 26 feet, all well lighted. The Representative Hall is 84 feet x 56 feet x 48 feet high with coffered ceiling. The gallery is behind the speaker and is separated from the main room by coupled shafts with caps and bases of marble, and will seat 250 persons. The seats are arranged amphitheatrically; this room is finished in black walnut.

The Supreme Court is on the second floor, 50 feet x 31 feet, and 35 feet high; it is finished in oak.

The library is over the centre of the main front; it is 55 feet x 85 feet and 35 feet high, paved with encaustic tile; it is finished in oak for bookcases, of very much plainer design than furnished by the architect. The light shafts at the centre of the intermediate parts of the building support colonnades which extend from the ground floor to the roof, and give ample light and ventilation to the halls and other parts of the building. The building is abundantly light in every part, and from its open character forms many unexpected vistas. Some day perhaps the State will have the money to expend on stronger colors for the interior. The building cost $2,500,000.

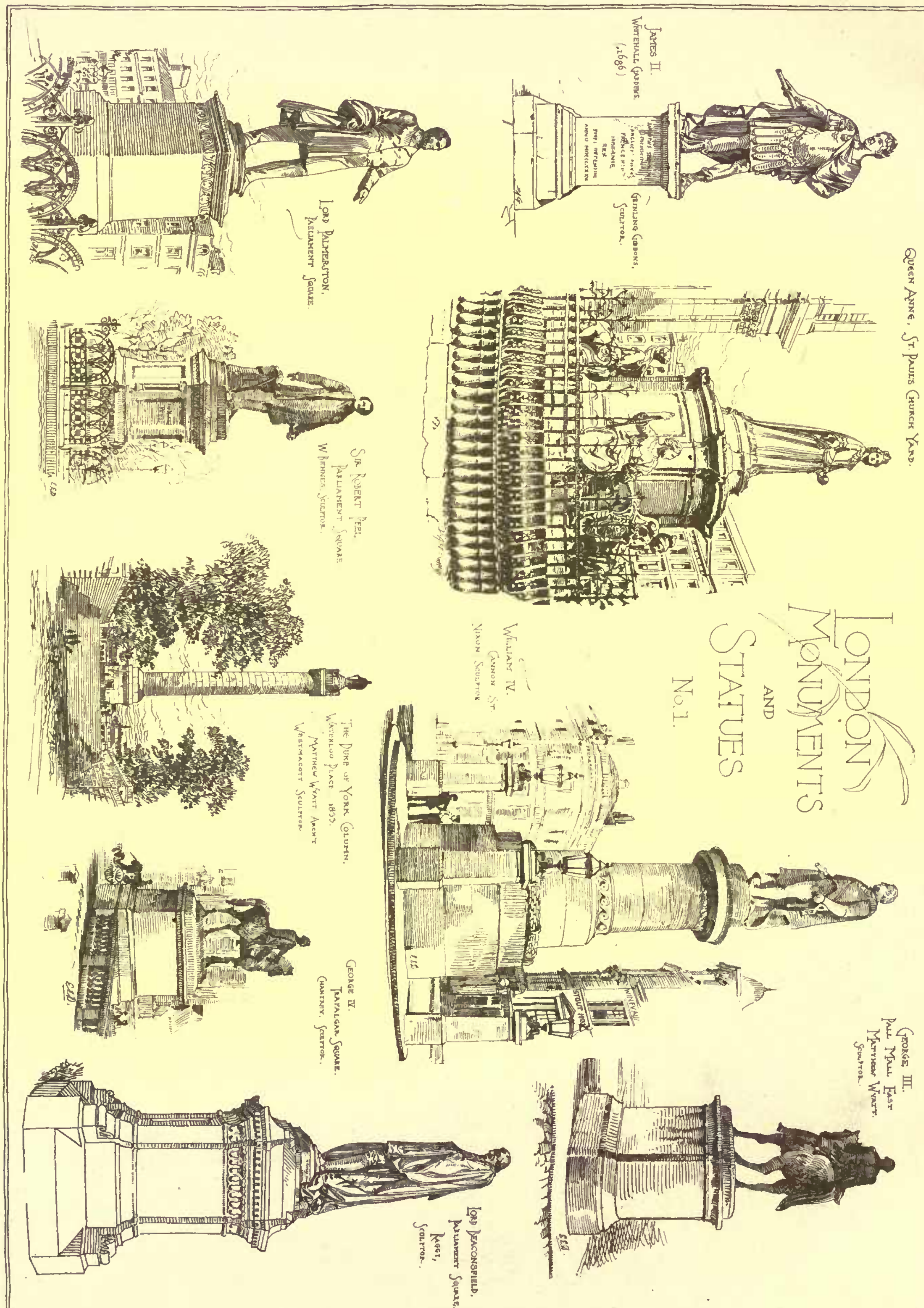
ROUEN CATHEDRAL, AFTER AN ETCHING BY LHERMITTE.

THE Cathedral of Notre Dame at Rouen, of which only the western façade is shown in M. Lhermitte's etching, is one of the grandest

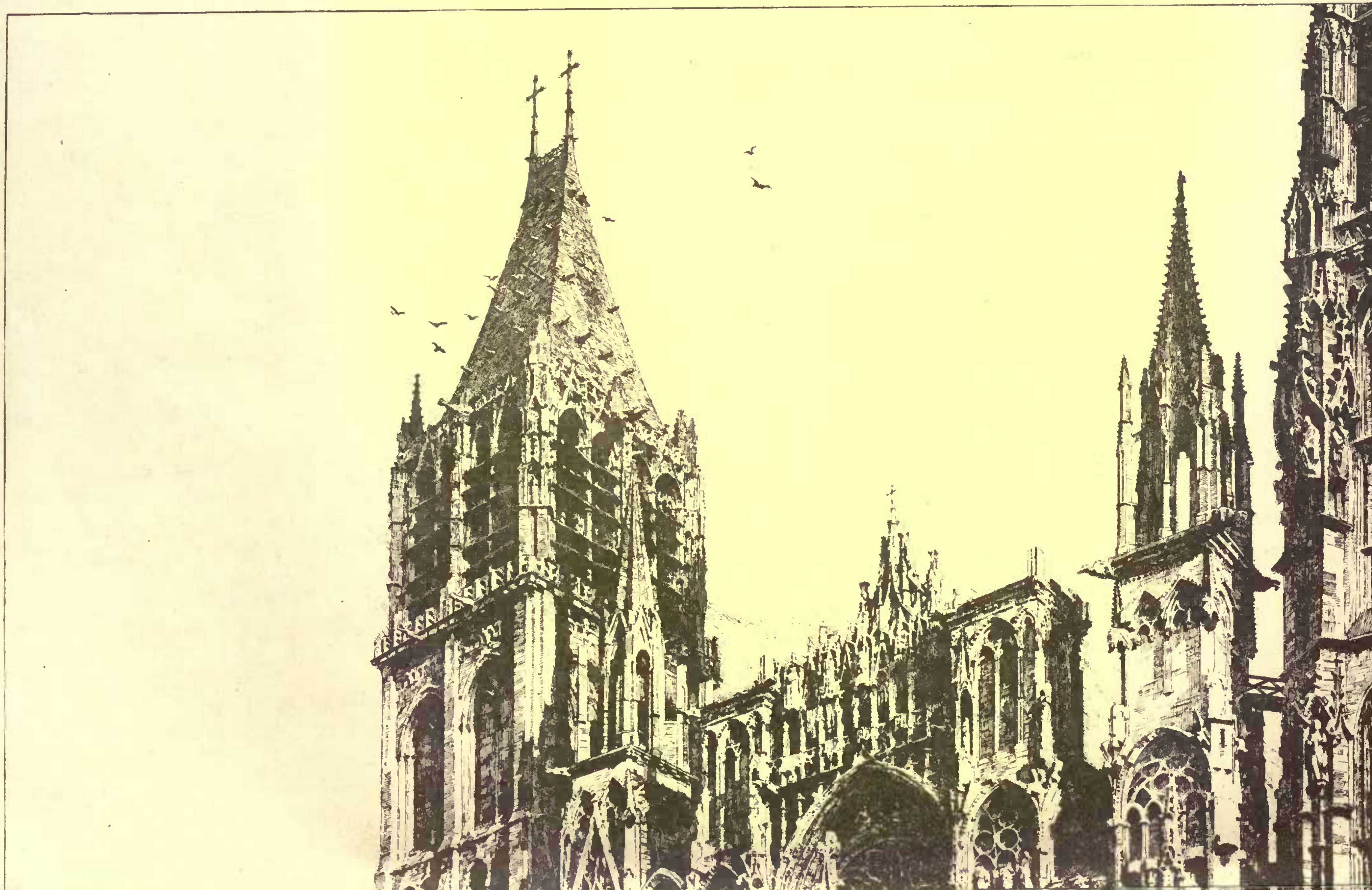


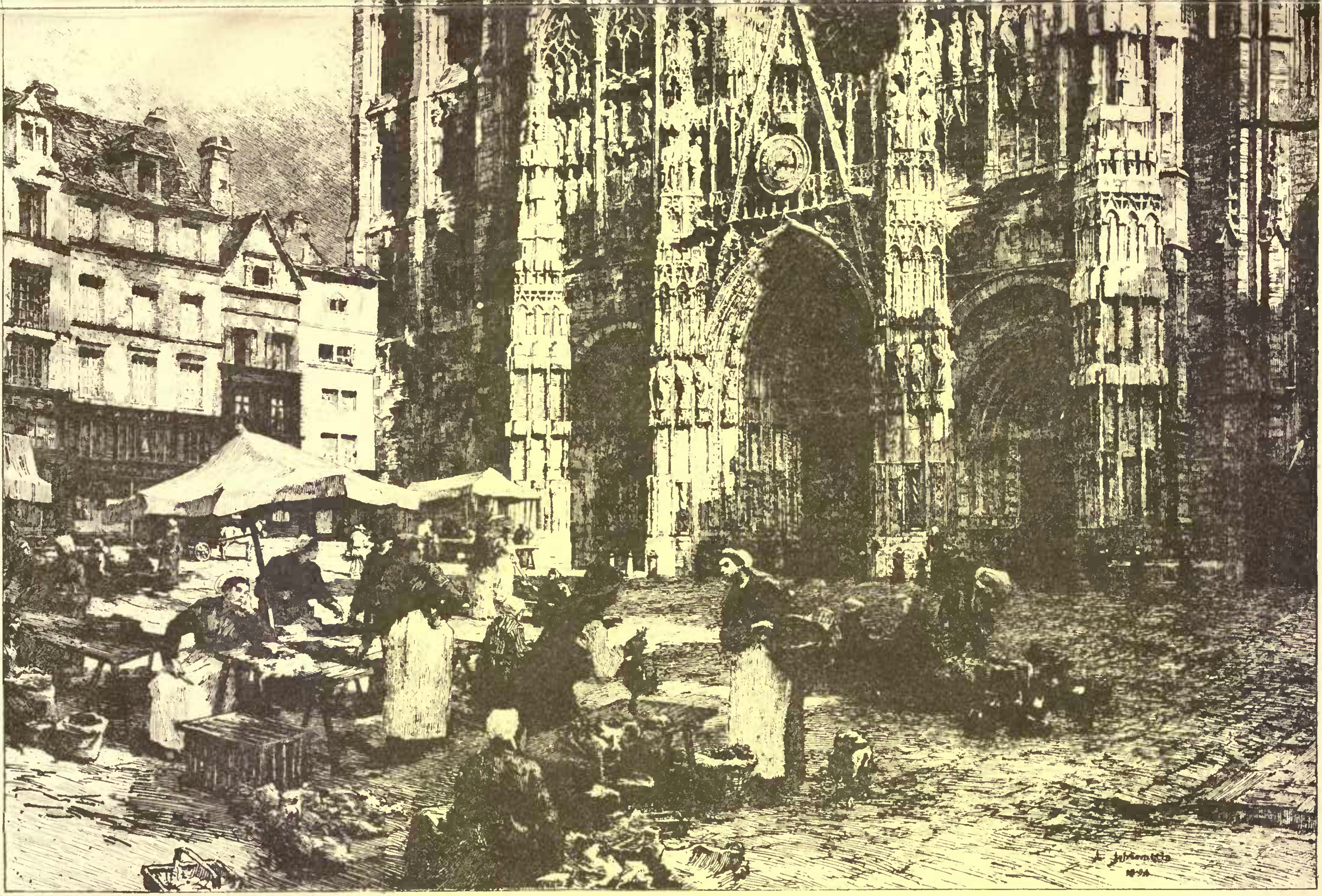
The State Capitol, Hartford, Conn.

— R. M. Upjohn, Arch't. —


London Monuments and Statues
No. 1.
James II.
Whitehall Gardens.
(1686)
Grinling Gibbons,
Sculptor.
Queen Anne, St. Paul's Church Yard.
Lord Palmerston,
Parliament Square.
Sir Robert Peel
Parliament Square
W. Behnes, Sculptor.
The Duke of York Column,
Waterloo Place 1833.
Matthew Wyatt Archt.
Westmacott Sculptor.
William IV.
Cannon St.
Nixon Sculptor.
George IV.
Trafalgar Square.
Chantrey, Sculptor.
George III.
Pall Mall East
Matthew Wyatt.
Sculptor.
Lord Beaconsfield.
Parliament Square.
Raggi,
Sculptor.
Heliotype Printing Co. Boston

American Architect and Building News, Jan. 31 1885

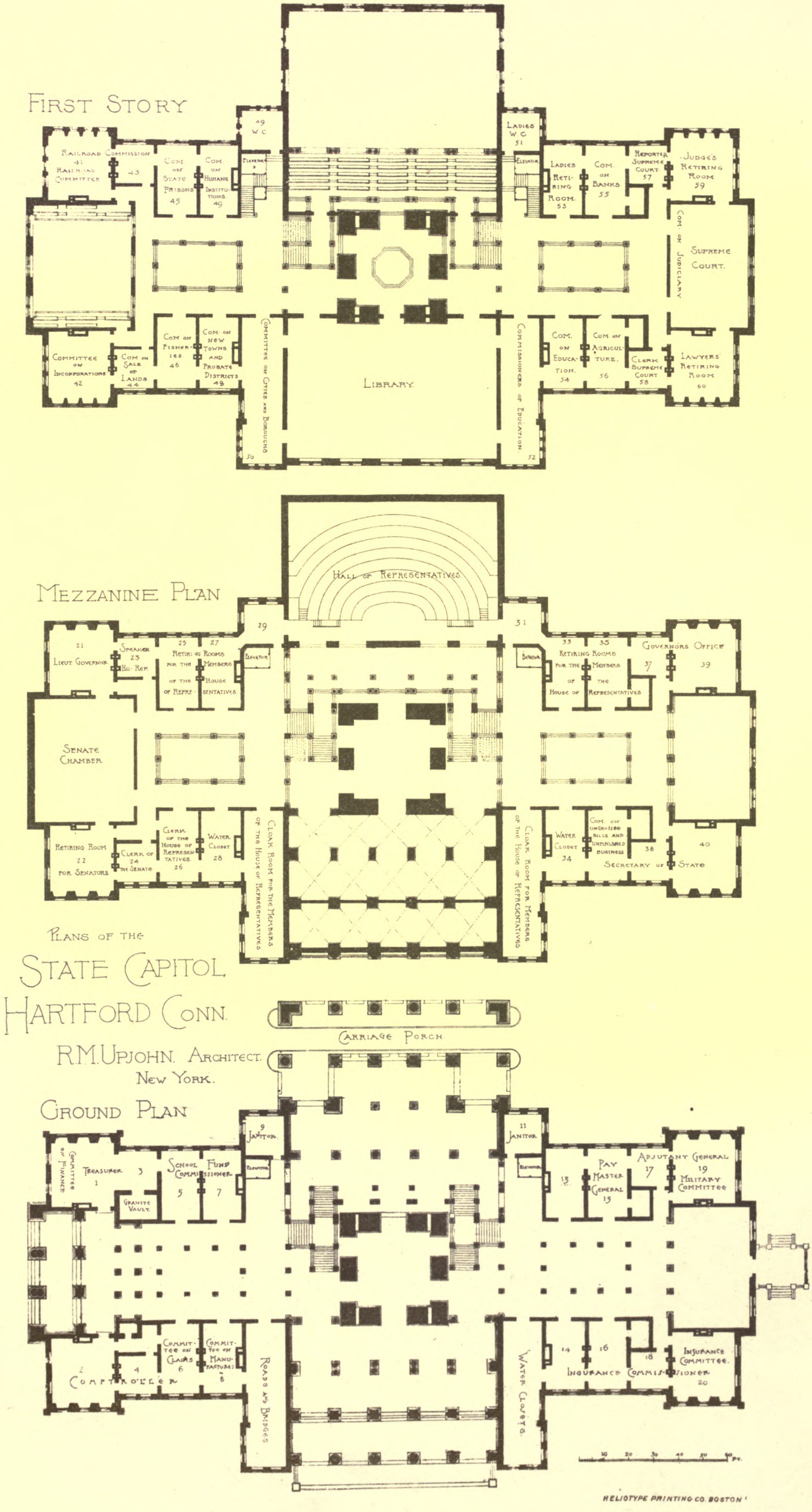




ROUEN CATHEDRAL.

HELIOTYPE PRINTING CO. BOSTON

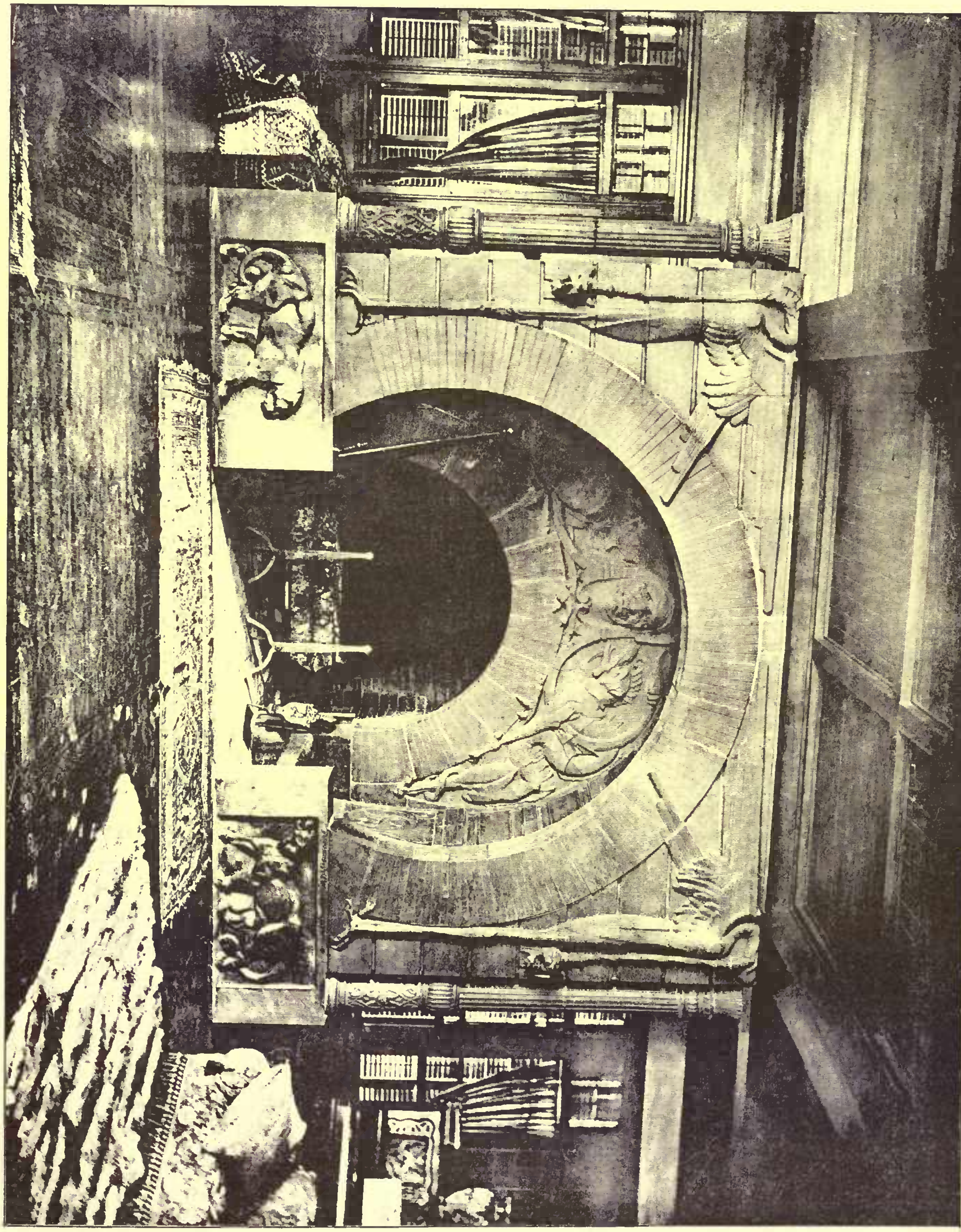
AMERICAN ARCHITECT AND BUILDING NEWS, JAN. 31 1885 No. 475



Plans of the
STATE CAPITOL,
HARTFORD CONN.
R.M. UPJOHN, ARCHITECT.
NEW YORK.

HELIOTYPE PRINTING CO. BOSTON

AMERICAN ARCHITECT AND BUILDING NEWS, JAN. 31 1885 No. 475



FIREPLACE FOR DR. R.C. GREENLEAF, LENOX, MASS.
J. PH. RINN, ARCH'T. — T.H. BARTLETT, SCULPTOR.

PHOTO CAUSTIC, HELIOTYPE PRINTING CO. BOSTON.

Gothic edifices in Normandy, although remarkably unsymmetrical in plan. The principal parts of it date from 1207–80, but the central portion of the western façade was erected by Cardinal d'Amboise, the favorite minister of Louis XII, in the sixteenth century. This front is about 180 feet wide, and is celebrated for the variety and richness of its carving. The two unfinished towers are of unequal height. The "Butter Tower," the loftier and more beautiful, 230 feet in height, takes its name from having been built with money paid for indulgences to eat butter during Lent. The central spire over the transept was destroyed by lightning in 1822, and replaced by an ugly spire of cast-iron, 492 feet high, in which a spiral staircase leads to the top. The interior of the Cathedral contains several stately monuments, notably those to the Cardinal d'Amboise and the Duc de Brézé, husband of Diana of Poitiers. Henry II of England is buried here, and the heart of Richard Cœur de Lion here found rest. The Cathedral also holds the tombs of Rollo, first Duke of Normandy and his son, William of the Long Sword. Its interior dimensions are about 435 feet in length, nave and aisles 105 feet in width, length of transept, 175 feet, and height, 90 feet. It possesses three fine rose-windows.

Léon Augustin Lhermitte, who etched the original of this plate, was born in Mont-Saint-Père (Aisne), and studied under Lecoq de Boisbaudran. He won a medal for painting at the *Salon* of 1874 and another in 1880. As a painter he is one of the most worthy followers in the school of Millet and Bastien-Lepage, and ranks exceedingly high as a draughtsman of the figure in charcoal. Hamerton, in his "*Graphic Arts*," praises him without stint, and a drawing of his, with one by Allongé, illustrates the chapter on charcoal drawing in that work. M. Lhermitte, we believe, has not before this etched many large plates. Several of his etchings of architectural subjects have appeared in the *Portfolio*.

FIREPLACE FOR DR. R. C. GREENLEAF, LENOX, MASS. MR. J. PH. RINN, ARCHITECT, AND MR. T. H. BARTLETT, SCULPTOR, BOSTON, MASS.

THIS fireplace, which is 16 feet wide, 12 feet high, and 8 feet deep, was executed in terra-cotta by the Boston Terra-Cotta Company.

THE MONUMENTS AND STATUES OF LONDON. — PLATE I.

FOR descriptions see article elsewhere in this issue.

THE STATE CAPITOL, HARTFORD, CONN. MR. R. M. UPJOHN, ARCHITECT, NEW YORK, N. Y.

[Gelatine Print, issued only with the Gelatine Edition.]

THE MODERN ARCHITECT AND HIS ART.[1] — II.



Old House at Thornhill, Yorks, Engd. date 1661

COMING to our second point, we have to inquire when and from what cause the change from the old to the new system of architectural practice took place. And here we must come back to our own country again, first, because we are speaking of English art, and secondly, because a similar change has not come over the architectural practice of other countries. I will begin by saying that the old system had lasted in the world generally from the building of the Tower of Babel to the time of the Gothic revival. Ever since English architecture was English architecture, it had been born and bred and fostered and propagated in English workshops. The Gothic revival meant not only confusion to architecture, but death to the art of the workshop. I do not mean for a moment that the art of the workshop, or the craft carried on there, was of a high order before the inauguration of the new condition of things, but I speak of one system of design as opposed to the other system of design. How could the arts of design flourish then, when, from the king on his throne to the merchant on his stool, no one cared one dump for art? Why, the very life of art, its sinews, its flesh and its bones is the living thought it contains and the living interest it creates. If there were no demand for literature, language would not be cultivated; if there were no dancers, the piper would cease to play. Will the crafts develop their cunning if there is none to order and none to heed? It was not patronage only that was wanted, but employment. People, when they are uncomfortable about the results of the Gothic revival, are fond of pointing to Gower Street as a justification for the annihilation of traditional art. But you may depend upon it, had there been the demand for higher things there would have been the supply. However homely, or, if you like, however ignoble the art done just before the new stimulus came, the traditions of the better times still lingered on in the workshops, and the bricklayer, the carpenter and the plasterer who hung on were men with some notion of style and some love of detail. The early Queen Anne had its leanings towards the picturesque Elizabethan, and the houses of the period are singularly well adapted to English minds and English scenery, and their fittings are in nowise unworthy of the best traditions of the English workshop. I have purposely made this digression in order that I might insist upon the fact that so long as the traditional art remained in force, and the workshops were the nurseries of design, so long the old scope of architecture, and the connection of the architects with the crafts were maintained. And, while on this point, let me remark upon the significant fact that while certain architects still adhere to traditional art, English architecture gained no advantage by their adhesion; nor did they themselves strike oil, and for the simple reason that, like the Goths, they swamped the traditional art of the workshop with their new-fangled types and rolls of details prepared by the soft-handed clerks in their offices, and accomplished the complete strangulation of traditional art. So it comes to pass that the tale of honored names of English architects passes on from Pugin to Barry, Scott, Street, Butterfield, Shaw, Pearson, Bodley, and Philip Webb, and leaves them — shall I say? — inconspicuous in the crowd.

But I have yet to account for the decay of architecture before the Gothic revival, and also for the change from the old to the new system of architectural practice, and the explanation I offer for the one applies to the other. I have shown how low the arts had fallen at the beginning of this century through neglect, and I cannot see that you could expect that art should engage men's attention when you remember the vast number of social, political and religious problems that were then agitating England. Professor Seeley's valuable book on the "*Expansion of England*" has helped me to see why the faculty for design died out with us in the eighteenth century, for he shows how entirely English interests were then centred in America and her other colonies. Think of the war-ships that had to be built, the armies to be equipped, the colonies to be fought for and occupied, and, later on, think of the machine-looms and steam-engines to be invented and perfected, and the railways to be made! How naturally does the engineer spring into existence amid the demand for the useful arts! How naturally does the eye of the historian pass on to the record of that noble set of engineers and mechanists and mathematicians: Davy, Watt, Cavendish, Arkwright, Herschell, Stephenson, and Brunell! And how natural that the men of genius should gravitate, not to the ornamental arts, as in earlier days, but to the useful arts! Yes, one may well say that English science had produced a perfect vacuum long before the scientific investigator had discovered the way for himself, and that in an unsuspected direction.

And now, having considered the origin of the engineer, who is one of the cuckoo intruders in the architect's nest, let us turn to the origin of that still bigger bird, the ornamentalist or expert in the decorative arts. I said just now that the Gothic revival had inaugurated the change from the old system of architectural practice to the new. Before this revolution of taste took place, the architect was the leading spirit of the building he designed, but he did not stand alone. His designs or models for stone, brick, iron, wood, and plaster work were backed by the traditional skill, and types and methods of craftsmen each of whom was more or less of an artist. The architect was only the prime minister; the workmen represented the departments. He was only the president for the time being of a little republic of art. From what we know of Wren, Inigo Jones, and the Chambers and Adams, the architect was conversant with every branch of the work included in the structure. He supplied the plans and sketch elevations and the leading details (as in John Thorpe's case), but the hundred and one odd details required for afterthoughts and emergencies might fall to the conduct of the workman, who, at all events, would be quite competent to deal with them, if so required. Here, then, we have architecture carried out under the best auspices, where architect and workmen are in perfect sympathy in matters of taste, the designer has a fellow-worker in the handicraftsman, one craft helps and overlaps the other, the executive and the theoretical go hand in hand, like twin sisters, the structural and the ornamental proceed along the same lines, and we have building which deserves the name of architecture. The Gothic revival upsets all this harmony of procedure, for the whole of the traditions of the past must be sacrificed, and new types, mouldings, traceries, carvings, groinings, decorations and the rest of it are introduced, about which the workman knows nothing and cares less. From henceforth you must look no more to the English workshops for the inception of types and evolution of ideas. The old "*Temeraire*" of English art having been sent to her last home, a bright new Venetian gondola takes her place and rides proudly out to sea, with seven Gothic lamps at her prow, an Oxford graduate and a few able enthusiasts to work the oars, fire off the guns, and take care of the cargo of sketch-books and romantic literature on board. Naturally the gondola is first attracted to Venice, but as time goes on the taste of the crew changes, and you find them flying about in all directions, and bringing home valuable spoils in the shape of numberless new sets of doors and windows to offer at the feet of a grateful people. And the merit of the new types consists in this, that they are quite unique in England, and that the British workman cannot move a step, as he copies them, without full-sized details of every part. Now, my explanation of the origin of the specialist decorative artist is this: having destroyed

[1] A paper read by Mr. John D. Sedding, at the second ordinary meeting of the Architectural Association, on "The Modern Architect." Continued from No. 474, p. 43.

the old system of art, the Gothic revivalist found himself unable to construct a new system that would work; he had accepted a task which he was unable to cope with. He had a strong love of art, a true sense of the intimate relations of the lesser arts with architecture; but he found things too much for him, and, instead of raising an army of fellow-laborers in the workshops, he called into existence certain specialist assistants to aid him in the conduct of his practice, where he lacked time or ability to carry out the work himself. The mischief of the whole business has been that he was only a learner himself all the time he was carrying out works in various styles; he has been only a blind man leading the blind. He was up a tree all the time himself, and the specialist has been found an indispensable help in supplying his necessities.

I come now to my third point. Is it possible for architecture under its present conditions to be carried out upon the old lines, and if so, by what means? To the first division of this point my short answer is, No and Yes. No, if the present conditions are to remain unchanged; yes, if things change for the better. In dealing with the whole matter before us I do not want to arraign modern art for difficulties inherent to it, nor do I want to multiply the responsibilities of the architect. That some of the higher branches of an architect's work have been abandoned is undeniable; and I plead for the recovery of these at any cost. In claiming this I do not desire to extend the radius of the architect's proper work. I am even arguing for the lessening of his labors by bringing the handicraftsman into a more active participation in the work he has to do. This was the old system, and it is the only practical solution of the case. The question is, to what extent our present difficulties are inevitable or irremediable. I have no hesitation in putting at the head and front of our difficulties this of having to employ revived styles. Any suggestion that you or I can make which will indicate some way of mitigating our sufferings in this matter will therefore be a boon. We are in for the use of all the various phases of the various periods of architecture, extending from the thirteenth to the eighteenth centuries, in England and abroad, and when it is remembered that the giants of the past had all their work cut out to master the capabilities of one style only, the vastness of our task is appalling. Every post brings us in a request, from this quarter or from that, for details of buildings which may each be of a different style. Add to this that one must keep touch with the progressive science of the day, and must be able to speak authoritatively of all the rival "sanitary specialties" and rival ventilating and warming schemes and electric-lights, and hygeian rock and asbestos, and American joinery, and the scores of dodges for minimizing art in the workshop, and girders and lifts, and "Acme" this, or "Imperial" that, and "Eclipse" or "Last forever" the other; to say nothing of having to pronounce off-hand upon Metropolitan Building Acts, and having to wade through surveyors' quantities and builders' accounts — is it any wonder if the architect gets so tired out with the business side of his work that he gladly leaves the problem of art production and ornament to the specialist decorator and manufacturer? You will observe, too, that at conferences and in presidential addresses and that sort of thing, where it is necessarily to speak cheerily and respect the feelings of the profession at the same time, the architect has invariably only one sovereign remedy to suggest — one patent salve is to heal all our disorders — and that is the specialist. The specialist, either inside or outside of the profession, is to ease everybody and everything all round! The proposal is that there shall be a sort of inner circle of the profession. The profession is to keep a paddock for the prize animals, who are to be warranted to have only one gift each, and who are to run round the paddock in a given groove all their lives. And all the sectionally-gifted persons are to make up one entire concrete architect, on the principle of making a quilt if you have enough patches to cover it. I grant you that, according to the present state of things, specialists must exist to do such things as these: to superintend the imitation of old work; to carry out decoration in a given style, Pompeiian, Egyptian, Classic or Gothic; to restore or build Gothic or Classic churches, Elizabethan, Jacobean or Georgian houses, and the like. The question, however, arises here: Are we to go on imitating the styles of the past? Specialists are necessary if we do go on in our present courses; but if we are to get out of the mists and on to the hill-tops again, we must train ourselves for our future liberty. If we want to perpetuate chaos and will-o'-the-wisp art, I do not know that we can devise a better means to that end than the establishment of representatives of the rival styles and the rival trickeries of the day. But surely we do not want practitioners of one accomplishment or one idea! Surely we do not want to ruin and degrade the noble art of architectural design, by introducing into it that miserable division-of-labor system which (as Mr. Morris points out) has in the case of our manufacturers reduced the workman to a machine, effaced his individuality, taken away all the pleasure of labor, and destroyed the standard of excellence. The making of architectural design deserves a better system of procedure than the manufacture of a modern pin! Let us, then, listen — no, not for a moment — to the bewitching suggestions on this head. The disorder of modern architecture is too deep-rooted to be remedied by the quackery of a specialist. We will not allow the great factory and machine system introduced in the great art that has fallen to the care of our unworthy hands. Let us rather take courage and look forward to the time when the jumble of styles will be cleared away or reduced to system, and prepare ourselves for an all-round practice in our vernacular that is to be. Depend upon it that it will not be the one-eyed, or one-legged, or one-armed, or one-idead specialist practitioner that will then be sought for, but it will be the architect with the most individuality, the most culture, the most skill, the most efficient training, that will be sought for and found most useful to the architecture of the future.

But you may well now remind me of my promised suggestion of the means I would propose to bring about the redemption of the old ideals of our art. First, I would say, let architects determine at all costs to recover lost ground. Secondly, let architects endeavor to render the types now in vogue more malleable for nineteenth-century use in our workshops, by classification or otherwise, by which means new traditions may be established, and the standard of excellence raised to something of its old pitch. In regard to the first point, some of us have grown too old in naughty, slothful ways to hope ever to accomplish much in the personal manipulation of the handicrafts, but we are none of us too old to determine, God willing, that our younger brethren shall have better chances than we had at their age, better chances for modelling and drawing ornament, and for taking their share in the design of house-fittings and the like. None of us, moreover, are too old to help to dignify the labor of the workman whose dusty clothes soil the best Sunday-go-to-meeting coats of the members of the Royal Institute of British architects, as they accidentally come in contact with him in the builder's yard. We are none of us too old to help to establish new traditions for the workshop, by classification of types and features done in such a way that they may appeal to the workmen in a more practical, familiar and lovable way than they do now.

May I divert your interest for one moment from that all-important matter, the modern architect and his art, and ask you to look at the British workman? What is his condition? What are the issues of his life's work? What have you done for him? We left him in the eighteenth century, a magnate, according to his personal qualifications, in his little parliament of art, the workshop, evolving architectural types, and putting his whole soul into his work. In those days he was an intelligent being, following his craft joyfully, because he excelled in it, and knew what he was about, and had a felt place in the world. You have scattered those workmen, you have dissolved these little republics of art that in old days held sway in every town and village in the land, and what have you put in their place? You have drowned the English handicrafts by opening up the sluices of a ceaseless tide of archaic types, and how has your eclecticism affected the British workman? Certainly you have with a vengeance directed his eyes to the wonders of old art, and you have given the charm of novelty to his every-day occupation; you have introduced him to a very Pandemonium of tit-bit types; you have shown him how various have been the doors and windows in the buildings of past days; you have muddled his ideas and confused his brain, but you have done nothing to form his taste or settle his standards; you have added not one single pet-moulding to his tool-chest, nor helped him to pigeon-hole a single familiar feature; he has no lasting impression of any piece of work you ever gave him to do. Had *he* had the origination of the changeful types that have passed before his eyes instead of *you*, he might have retained the same vague sense of things that you have yourself; but, as it is, his memory is no more fixed about the patterns he has worked than the loom which turns out patterns mechanically. He is in for the deluge, and no soft dove comes to whisper hope in his ear. He is the slave of caprice, the plaything of fickle humors, the sport of mutable tastes and veering winds of fashion. What a long, dreary jest his life has been, and how, in his sober moments, he must sigh for the blessed, irredeemably bad art of the bad days before the deluge! Yet, in this much-abused, much-misunderstood, much-enduring, unheroic, untrustworthy, misbelieving, self-seeking, wife-beating, drunken, conceited, shallow, *Daily Telegraph*-reading, school-of-art trained man behold the martyr of the nineteenth century. The Gothic revival proved the winding-sheet of his peace of mind, and one thinks that it had been better for his mental, his social, his moral and religious state, had the modern Gothic architect never been born! Nay, we of the Architectural Association would almost have preferred that he had been left daubing stucco walls and chasing those curly ornaments and smiling cherubs on tombstones, and making those moulded Jacobean pews that we find so fascinating when we go to study Gothic architecture in some tip-top mediæval church.

Just think of all the sad, bad, and mad architecture that has passed under the British workman's hand, say, in these last thirty-five years. In 1850 he was rearing a Norman apse upon the ruins of an old chancel that had been destroyed in the interests of morality and purism. In 1855 he was building a thirteenth-century hotel, with details cribbed from Salisbury Cathedral, and a bank adjoining it in the Ducal Palace style; this took him some time. In 1870 we find him titivating an old Queen Anne house in a Gothic manner; and in 1880 he was titivating a Gothic house in the Anglo-Foreign "Early English" Queen Anne manner; and now, in this year of the architect's salvation, he is satisfactorily completing the memorial of the nineteenth century, at the west end of St. Alban's Abbey, under the reputed direction of our all-accomplished, soft-handed, "emancipated," and only true British architect, Sir Edmund Denison Beckett, Q. C. Now, I want to know if we cannot do something to regenerate the art of the builder's yard and to raise the workman's position, and, if no higher motive affects you, think how it is for the interests of the modern architect and his art that you look steadily into this matter and do your best in it? I am firmly persuaded that

there will be no good architectural design and no good execution until the craftsman can be brought to participate with the architect in the working out of architectural ornamentation. It is just one of those things about art which marks its divine origin and inherent dignity. You can get faultless mechanical work out of machines, and can get good mechanical work out of human machines; but noble hand-labor is only found where the workman uses his intelligence, and where he is able to express the individuality of the individual. I would say, then, begin the work of regeneration by throwing away all your petty professionalism. Give the workman his rightful participation in your aims. Let him see into your great mind. Make him something more than the transcriber of your hesitating lines; lift him nearer to your own level of knowledge, so that he may know something of the essential qualities of the style he is working in, and may at least interpret your thought sympathetically, render in his own idiom the things you put before him, and find some way of escape for the soul within him. Thus, and thus only, will you get good architecture and good sympathetic workmanship. Thus, and thus only, will you effectually and fairly lift some of the crushing load of responsibility and labor from your own shoulders, and get the help-meets God made for you. The old architect lived long and saw good days, because he was thus helped. But Pugin, Scott, Street and Burges died young, and you know that the doctors say it is worry and not work that kills. This single-handed system of architectural design, where every detail must be supplied from the office, was too much for them. More than this, they were men of singular love of good workmanship, and nothing worried them more than to see their work carried out unsympathetically, or to find their designs carried out to a wrong scale, or their mouldings worked from the wrong side of the sectional line.

I conclude this paper with two propositions which aim at the amelioration of some of the evils I have here enlarged upon. The first is as to the selection and classification of the architectural types now in vogue. The second relates to the provision of technical education for architects and craftsmen. With regard to the first point, it is clear that no scheme of architectural design has ever been practised without a basis of work-shop traditions. Shall we then — is it worth while to try and formulate our tentative styles and to systematize our distracted types, with a view to rendering things permanent and to assist the workmen? If so, you must have a grammar and an alphabet before you can form words and sentences. Now it so happens that never since the world began has so much architectural knowledge been accumulated as is now stored up in the brains and on the shelves of the English architect. Why, then, should not these experts be set to work to formulate and render into serviceable shape the leading mouldings and forms and features of the styles in vogue? Why should not the destroyers of old English traditions do penance and make reparation for their naughty deeds, and build up new traditions? Why should we not have a well-arranged series of details of arches, capitals, bases, plinths, friezes, cornices, staircases, doors, windows, etc., for workshop use?

The second proposition is to have a technical college for the instruction of architectural design, to be for the use of architects and craftsmen. If modern architecture showed itself in as attractive form to the public as English music does, the scheme would receive the attention which we who know our pitiful state think that it deserves. One thinks that if the scheme were started under proper auspices it could not fail to receive the support of the Royal Academy, of the Institute of Architects, of the Architectural Association, and of all other public bodies who have any care for the advancement of the various arts and sciences connected with architecture. If such a college were set on foot one might feel perfectly secure about the architecture of the future, for it might be expected to bring about that harmonious cultivation of the crafts without which the practice of architecture is a delusion and a snare. Depend upon it, the hope of English architecture must come from the workshop, and not from the architect's office. Cast aside, then, as unworthy and profitless, the notion of specialists within or without the profession, and this for your own sake, your heart's sake, and the sake of the art of the future. Cast aside, also, the notion that the mere personal taste, learning, theoretical knowledge, or power of penmanship of the architect will avail anything for the real advancement of art, unless the craftsman who works out his ideas reflects his accomplishments and can sympathize with his aims.

What we want is not so much men who can design in many styles of more or less remote antiquity, or men who can sketch well, but men of aim who can lead the aimless, men who by their personal acquaintance with the handicrafts and personal participation in the production of ornamental art can build up new traditions for the workshop, restore the credit of English workmanship, and recover the lost ideal of the English architect.

The President said he had throughout the reading of Mr. Sedding's amusing paper, been waiting to hear how he proposed to meet the difficulties of modern architectural art. He had made an onslaught upon the Institute, and seemed to have a very low opinion of what it had done for architects, while the Association had also been hit very hard. According to Mr. Sedding the Gothic revival had been an absolute failure, but Pugin, Scott, Street, and Burges had carried out works of a class that were a source of admiration and study to all, buildings that could worthily hold their own with those of the past. It was true that men crowded into the profession whose work was abominably bad, and the same thing must have happened in all past times. Mr. Sedding had spoken of the divorce that had been effected between the architect and the workmen, but there were some architects, Mr. Sedding amongst them, who took as much interest as was ever done in the training of the workmen. He thought that the architect would be willing to stand hat in hand before the workman who took a pride in his work. The more the architect showed such a man that he respected him, the better would be the work executed. When Mr. Sedding had attacked all modern systems of working, the question arose what he proposed to set up in their stead. One of his proposals seemed to be to instruct the workman in ornament by establishing a technical college which should formulate and systematize our detail, but he believed that if the suggested standard form of any detail were adopted and set before Mr. Sedding, or any other well-known architect, he would decline to be bound by it. It seemed that all that could be done was, first, for architects to do their best in designing, and then try to interest the workman in the undertaking, and, secondly, to look forward to the establishment of some more systematic course of study, with some more definite aim than hitherto.

Mr. Gotch agreed with the President that Mr. Sedding had drawn a gloomy picture, but he thought it was most beneficial that now and again they should hear an address from some one like Mr. Sedding, able to hit out freely all round, and to make every one discontented with himself and his work. Contentment was, in his judgment, the bane of life and the bar to all progress. It was a judicious discontent that had led to all improvements in the past. The lecturer's idea of educating the workman was very good, provided it could be carried into effect, and he should be very glad if the vernacular builders' details could be improved thereby. But the majority of our mouldings and other details of domestic work were turned out of machines by the mile, and it was impracticable for the architect to go and educate the machine. The fact was that the whole tendency of modern procedure was at fault. If the architect had *carte blanche* and a succession of enormously rich clients, to whom time and money were matters of little consideration, he might be able to turn out work of a higher class. The bane of modern building was the contract system; practically, the architect had little or no opportunity to alter his work while in progress, because of the fears of extras. He was not sure that Mr. Sedding was accurate in assuming that the system of employing specialists was entirely modern. He did not think that William of Wykeham and the other great mediæval builders whose names we knew were practical architects; they were the clients who paid the men. Probably they never mastered details, and only set other people to work. The style in mediæval times was simple, the examples were close at hand, and the number of possible variations were very limited. He was sure that in mediæval days they had quackery amongst architects, and he had that day noted an instance of this in the old play of "The Alchemist." They also had bad workmanship, probably more in proportion than we have, but most of it has been removed from sight by the merciful hand of Time; and in the same manner of the work of the present day, only the good would survive to future generations. If the public wished for good building they could have it; but all that was demanded was the cheapest buildings that would serve the purposes of the day and last the requisite number of years.

Mr. W. Hilton Nash, in seconding the vote of thanks which had been proposed by the last speaker, said he believed that work as good as that of old times had been done during the Gothic revival, and instanced a little church in the Isle of Purbeck, built from the designs of a recently deceased architect, at a cost of £40,000, as a proof of what could be done by modern workmen. Many modern buildings in London would be, he believed, greatly admired by future generations, and amongst these he would only name the Reform Club and the British and Foreign Bible Society's premises, which he believed would always rank amongst the noblest buildings in the metropolis. We had at this time, notwithstanding all Mr. Sedding had said, many earnest and hard-working architects amongst us.

Mr. Woods remarked that Pugin used to take a personal interest in instructing the workmen with whom he came in contact, and so did Burges. He concurred in Mr. Sedding's suggestions that a school might with advantage be started for instructing workmen in interpreting architects' drawings better than they now did. Still, in carving and other artistic details, better work was often turned out, where the workman was equal to his work, if he was not fettered with detailed drawings, but left in a large degree to his own resources.

Mr. J. Macland thought our schools of art would be more beneficial if the pupils were less restricted to mere draughtsmanship.

In replying to the vote of thanks, Mr. Sedding said he had for many years adopted the plan of having the same builder, a Cornish man, associated with him in works of restoration in Bedfordshire, Somerset, London, and South Wales, and other parts of England, and had found it very advantageous. It had been a great privilege to meet and greet the same workmen time after time, and to know that they understood and could reproduce his drawings. All the older hands had died or had drifted off now. In these days, when the architect received from all parts of the country, and by every post, requests for details of every period, it was impossible to revert to the old system by which the workman was trained and able to meet minor emergencies as they arose.

A SOCIETY FOR MUTUAL PROTECTION.

Boston, January 22, 1885.

To the Editors of the American Architect: —

Dear Sirs,—I read with pleasure the article in the *Architect* of January 17, on the proposed formation of a society for mutual protection similar to that now in operation in France, and trust steps will be taken at once to that end. There is everything to be gained by such an organization, especially by the younger members of the profession. I am glad the question has been proposed, and trust it will receive the attention it deserves. Yours truly,

An Interested Subscriber.

HOW TO BECOME A SUPERINTENDENT.

To the Editors of the American Architect: —

Dear Sirs, — Please give best course to pursue to become a good superintendent. Have fair education, but no special training in this line; have situation open as soon as I am able to fill it.

Subscriber.

[Begin by studying Clark's "*Building Superintendence;* read and keep for reference "*Notes on Building Construction;*" keep Trautwine's "*Engineers' and Architects' Pocket-Book*" in your pocket, and study it at every spare moment; visit and observe all classes of building in course of construction, and cultivate the acquaintance of intelligent mechanics willing to answer sensible questions. Do this, and in the course of a few years you will probably become a good superintendent.—Eds. American Architect.]

ONE MORE COMPETITION.

To the Editors of the American Architect: —

Dear Sirs,—I send you a gem. For magnificent cheek and subterranean ignorance it excels anything yet published that comes within our experience. Respectfully, Artifex.

NOTICE TO ARCHITECTS.

Notice is hereby given that the Board of Supervisors of Pottawattamie County, Iowa, will receive plans and specifications for the erection of a court-house building to be built in the City of Council Bluffs, for Pottawattamie County, Iowa, said building not to cost to exceed the sum of one hundred and fifty thousand dollars. Said building to have three fronts, and to be fire-proof throughout. To be erected on a foundation of piles and concrete, the same as the United States court-house now being erected in the city of Council Bluffs, and it is expressly understood that the county will make no compensation for any plans and specifications filed that are not adopted, and will make no compensation for the plans and specifications adopted unless the proposition for the issuance of bonds to build a court-house shall carry in this county, and parties filing plans and specifications shall make this agreement a part of their proposition, or they will not be entertained by the Board.

The successful competitor shall furnish a bond in the penal sum of three hundred thousand dollars, to be approved by the board, that the building shall not cost to exceed one hundred and fifty thousand dollars, completed and ready for occupancy.

The Board reserve the right to reject any and all plans.

Plans and specifications to be filed with the County Auditor on or before noon of the second day of February, 1885.

By order of the Board of Supervisors.

T. A. Kirkwood, County Auditor.

From Council Bluffs Nonpareil, January 15, 1885.

[The worst of all this is that half-a-dozen people calling themselves architects generally imagine, in such cases, that there is money to be made somehow out of the job, and submit what they are pleased to term designs. Then the local public, which of course sees no difference between this sort of individual and a real architect, immediately concludes that all architects expect to crawl after people who have jobs to dispense, and to fight with each other for them, and regulates its relations with the profession in accordance with this theory. Finally, the building begins to behave like most buildings constructed under such auspices, and caves in, or sags, or has to be torn inside out, to put in ventilation flues, or needs costly reconstruction in some other way; and the public thereupon adds to its previous stock of wisdom on the subject of architects the conviction that none of them know anything about their business. No one can blame the public much for this. It is not its business to investigate the qualifications of persons who call themselves architects; and if the profession does not care to guard itself against having its rewards and reputation taken away by cheap and ignorant speculators, no one else will take any trouble about the matter. — Eds. American Architect.]

TAKE CARE IN BUILDING NORTH WALLS.

Burlington, Iowa, January 23, 1885.

To the Editors of the American Architect: —

Dear Sirs, — The Jesuits of our city are building a large church edifice with a tower in the centre of its southern façade. The walls, ten feet in height on the south and about half way on the east and west sides, are faced to the height of ten feet with cut-stone ashlar. The north side and the remainder of the flanks are carried up to the same height as the cut stone with rubble masonry of a very good character, all upon a rock foundation. The brickwork commences upon a level at top of stone-work and extends up 125 feet. There came a long driving storm of rain from the northwest. The following morning it was discovered that the tower was cracking badly on the north and sides as far as the rubble masonry. It was soon condemned and care taken to prevent danger to people who went to see it. It was found to lean towards the north about a foot, and gradually increasing its inclination and its crushing of the rubble masonry and the brick walls. Work was immediately commenced to take down the north half of the whole tower, and finally the taking-down process reached the bottom, and it is now rebuilt with cement-mortar.

The points that the writer wishes to make are for the benefit of the younger members of the profession, as the older ones know all about it, except, perhaps, the aged architect of this building, who, it appears, did not know all about it. Be careful to have walls all around of the same material and method of construction, but on the north or shady side use finer and quicker-setting cement, or have the mortar joints smaller in proportion, so that they will become firm and solid as fast as those in the hot summer sun on the southern side. Be careful how you use iron and stone or brick columns in combination in store fronts where the openings are arched, as these materials do not work harmoniously together.

There may be enough information for the young in the foregoing to find a place in your valuable columns, if not, you know where the waste-basket is.

C. A. Dunham.

NOTES AND CLIPPINGS.

Reclaiming the Goodwin Sands. —A scheme has actually been put forward at Ramsgate, Eng., to reclaim the Goodwin quicksands and fertilize them by conveying thither the sewage of Ramsgate through a tunnel. — *Exchange.*

Effect of Lightning on Trees. — A few days ago, during a violent thunderstorm, a tall poplar on the Cour de Rive, a street in the upper part of Geneva, was struck by lightning. Directly after the occurrence Prof. Colladon made a minute examination of the tree. He asserts that the parts first struck are the highest branches, especially those most exposed to the rain. Thence the electric fluid runs down the smaller branches — affecting almost the whole of them — to the larger ones until it reaches the trunk. These large branches, and above all the trunk, being much worse conductors than the small branches, the passage through them of the fluid produces heat and "repulsive effects" whereby the bark and sometimes the wood are torn in pieces, the bits being thrown a considerable distance off. It not unfrequently happens that the upper branches and their leaves are destroyed; this is generally the case with oaks, which are often struck; but the leaves and young shoots of poplars and many other trees are such excellent conductors that they do not appear when struck to suffer any notable injury. This rule is so general that, though their trunks may be rent and their bark torn off, not more than two or three poplars out of a hundred struck by lightning have their leaves shrivelled or even discolored. This induction finds full confirmation in the condition of the poplar on the Cour de Rive, for it is not often in Switzerland that trees are struck by lightning early in May, when their leaves are young and tender. In this instance the principal and highest branch of the tree, on its southwestern side, was the first with which the fluid came in contact. Its leaves and twigs, neither withered nor tarnished, were torn into minute fragments and scattered about on the ground. This was the effect, not of the lightning, but of the concussion of air, exactly as if there had been an explosion of dynamite or gunpowder, and the windows of two houses close by were broken in the same manner and by the same cause. Before even the professor saw the tree he had expected to find not far from it a spring or stream of water, for the presence of water near the root of a tree is often the determining cause of its attraction for the electric fluid. In effect, the professor found, about four yards from the poplar, on its north side, a leaden water-pipe, and close to it a drain filled with waste water from a laundry. The principal fissure in the tree was also on the north side, and half way between it and the water-pipe a plank lying on the ground had been pierced by a concentrated jet of the electric fluid as it flashed towards the pipe by the shortest route. Many trees, especially poplars, may be compared to buildings the lightning conductors of which are not continued to the ground. A building of this sort, if struck by the electric fluid, would in all probability remain intact in its upper part and be seriously damaged beneath the part where the conductor ceased. Hence, by far the safest part of a tree during a thunderstorm would be its topmost branches. This explains why birds are so rarely killed and their nests so seldom disturbed by lightning, while persons who have sought shelter under the spreading branches of trees are so often struck. The electric fluid, finding the trunk and the larger branches imperfect conductors, is easily attracted by surrounding bodies, whether they be bushes or human beings. Large trees, especially tall poplars, placed near a house may serve as very efficient lightning conductors, but always on the indispensable condition that there is no well or running water on the opposite side of the house, for in that case the electric fluid, if it struck the tree, might pass through the building on its way to the water. In 1864 a house at Lancy almost in contact with a poplar on one side and a marsh on the other was set on fire by lightning, and the path of the electric fluid, from the point at which it left the tree, across the room of the building to the marsh, could be distinctly traced. Hence, in erecting lightning conductors it is desirable that their lower extremities should terminate in a stream, a well, or a piece of damp ground. The plant most sensible to electricity is the vine. When a stroke of lightning falls in a vineyard the leaves affected are turned red-brown or deep green, a circumstance which shows, in the opinion of Professor Colladon, that the electric fluid descends in a sheet or shower, and not in a single point, the number of vines touched — sometimes several hundred — by a single *coup* proving that the lightning has covered a wide area. This fact lends additional confirmation to the theory that lightning disperses itself among the smaller branches of trees and over ground covered by vegetation. — *Woods and Forests.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

310,880. APPARATUS FOR PRESERVING WOOD. — Edward Z. Collings, Camden, N. J., and Chas. F. Pike, Philadelphia, Pa.

310,882. FIREPLACE. — William Crook, Salisbury, Eng.

310,887. FIRE-EXTINGUISHING COMPOUND. — John M. Giblin, Sheboygan, Wis.

310,889. FIRE-EXTINGUISHING COMPOUND. — John M. Giblin, Sheboygan, Wis.

310,892. PERMUTATION-LOCK.—Chas. Hill, Los Angeles, Cal.

310,900. LATCH.—Paul L. Maltbie, Newark, N. J.

310,904. HEATING-STOVE. — Preston K. McMinn, Bement, Ill.

310,926. WOOD-STEAMING APPARATUS. — Van Buren Wheat, Orleans, N. Y.

310,930. SASH-FASTENER. — Oliver Benson, Hinsdale, N. Y.

310,960. WRENCH.—John L. Phillips, Sullivan, Ind.

310,964. MARKING-GAUGE. — Ransom Steele, New Britain, Conn.

310,972. WATER-CLOSET VALVE. — Herman C. Apel, Milwaukee, Wis.

310,981. HOT-WATER RADIATOR.—Wm. H. Brown, Indianapolis, Ind.

310,983. SASH-HOLDER. — Frederick Burmeistar, Cleveland, O.

311,020. WINDOW. — William De Mann, New York, N. Y.

311,023. PULLEY. — Wesley W. McChesney, Green Island, N. Y.

311,024. WELL-TUBE.—Frederick W. Miller, Brooklyn, N. Y.

311,026. FLUSHING-VALVE FOR WATER-CLOSETS —Michael T. F. O'Donnell, Boston, Mass.

311,031. CONSTRUCTION OF BUILDINGS. — Richard S. Pearsall, Sea Cliff, N. Y.

311,039. FIRE-ESCAPE. — Gottfried Schiedt and John A. Rehard, Toledo, O.

311,049. FASTENER FOR MEETING-RAILS OF SASHES.—Frank A. Weston and Henry C. Frost, South Pueblo, Col.

311,085-087. WATER-TRAP. —J. Pickering Putnam, Boston, Mass.

311,088. AUTOMATIC FIRE-EXTINGUISHER. — Daniel C. Stillson, Somerville, Mass.

311 089-091. SELF-CLOSING HATCHWAY. — Richard D. Thackston, St. Louis, Mo.

311,105. COVERING FOR CHIMNEY-TOPS. —Andrew J. Conway, Belleville, Ill.

311,115. LIGHTNING-CONDUCTORS. — Joseph R. Fricke, Pittsburgh, Pa.

311,120. ELEVATOR-GATE.—Albert U. Grummann, Indianapolis, Ind.

311,136. BENCH-PLANE. — Charles L. Mead, New York, N. Y.

311,149. CHIMNEY FOR DWELLING-HOUSES.—William E. Stevens, San Francisco, Cal.

311,152-153. HOT-AIR FURNACE. — Edward A. Tuttle, New York, N. Y.

311,154. REGISTER-FRONT. — Silas Tuttle, Jr., Brooklyn, N. Y.

311,156. MANUFACTURE OF ARTIFICIAL-STONE COMPOSITION.—C. Irvine Walker, Charleston, S. C.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report nine permits have been granted, the more important of which are the following: —

F. E. Yewell, 3 two-st'y brick buildings, e s Bruce Alley, n of Lanvale St.

Chas. H. Callis, 12 three-st'y brick buildings, e s Broadway, between Belair Ave. and John St.

Hy. Schaumberg, 3 two-st'y brick buildings, s s Sterrett St., between Paca St. and Sterrett Alley.

P. J. Dannenfelser, 2 two-st'y brick buildings (square) e s McDonough St., between Biddle and Chase Sts.

John Malone, three-st'y brick building, w s Wilcox St., between Eager and Chase Sts.

Helene Schmidt, 2 two-st'y brick buildings, e s Norris Alley, s of Townsend St.

Boston.

THEATRE. — Papers have been signed by virtue of which the old Hollis Street Church property passes into the control of Isaac B. Rich and William Harris, of the Howard Athenæum. Plans have been made for changing the building into a theatre, to be ready for opening September 1. It will be fitted in elegant style and will be modelled after the Globe, but its dimensions will be much less. The seating capacity will be about one thousand.

BUILDING PERMITS. — *Brick — Ferdinand St.*, cor. Columbus Ave., manufactory; Brush Electric Light Co., owners; L. P. Soule, contractor.

Taylor St., cor. Water St., planing-mill, 23′ x 69′; The A. T. Stevens Lumber Co., owners and contractors.

Wood. — Heath St., storage, 15′ x 18′; J. B. Mulvey, owner and contractor.

Mulvey Ave., cor. Heath St., 2 dwells., 20′ x 32′; J. B. Mulvey, owner; George Gigie, contractor.

Taylor St., cor. Water St., planing-mill, 22′ x 39′ and 41′; A. T. Stevens Lumber Co., owners and contractors.

Knowlton St., dwell., 21′ x 32′; A. H. O'Neil, owner; H. T. Hutchinson, contractor.

Blue Hill Ave., cor. Water St., dwell., 18′ 6″ and 25′ x 46′; Chas. A. Young, owner; Frank H. Fullen, contractor.

Winship St., cor. Washington St., stable, 30′ x 41′; Chas. Gilligan, owner; Chas. Whitham, contractor.

West Heath St., *No.* 271, stable, 18′ x 29′; Patrick Owens, owner; Chas. Whitham, owner.

Brooklyn.

BUILDING PERMITS.—*Van Buren St.*, n s, 100′ e Broadway, two-st'y frame (brick-filled) dwell., tin roof; cost, $3,000; owner and builder, Samuel Post, cor. Van Buren St. and Broadway; architect, Henry Vollweiler.

Stuyvesant Ave., s w cor. Madison St., 5 three-st'y brown-stone dwells., tin roofs; cost, each, $5,000; owner, Kate M. McCormick, 372 South Second St.; architect, Andrew Spence.

Bergen St., n s, 268′ e Clason Ave., 3 three st'y brick tenements, felt, cement and gravel roofs; cost, each, $4,000; owner and builder, T. W. Swimm, 391 Gates Ave.; architect, Amzi Hill.

Central Ave., e s, 40′ s Prospect St., three-st'y frame (brick-filled) tenement, tin roof; cost, $5,000; owner, Henry Matheis, 12 Central Ave.; architect, Geo. Hillenbrand; builders, H. Schachter and D. Krender.

Stagg St., n s, 350′ w Waterbury St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner, H. King, cor. Ten Eyck and Humboldt Sts.; architect, Frank Holmberg; builder, John Rueger.

Stagg St., n s, 350′ w Waterbury St., rear, two-st'y frame stable, tin roof; cost, $3,000; owner, architect and builder, same as last.

Stagg St., s s, 350′ w Waterbury St., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost for both, $7,500; owner and builder, Ulrich Maurer, 253 Stagg St.; architect, Th. Engelhardt.

Morrell St., *No.* 61, w s, 75′ s Moore St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,000; owner, Chas. Keppeli, 63 Morrell St.; architect, Th. Engelhardt; builders, M. Kuhn and John Rueger.

Moore St., *No.* 186, s s, e of Bushwick Ave., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,000; owner and builder, Geo. Zoetterlein; architect, Th. Engelhardt.

Prospect Pl., n s, 180′ e Vanderbilt Ave., 2 three-st'y brick dwells., tin roofs; cost, each, $7,000; owner, Robert Furey, 119 Prospect Pl.; architect, John Mumford; builders, Owen Nolan and Joseph Sims.

Lexington Ave., s s, 225′ e Sumner Ave., 6 two-st'y brick dwells., tin roofs; cost, each, $3,000; owner and carpenter, Wm. Godfrey, 548 Monroe St.; mason, Wm. M. Gibson.

Clinton St., e s, 80′ n Third Pl., four-st'y brown-stone flat, tin roof; cost, $8,000; owner and builder, F. W. Fowler, 8 Verona Pl.; architects, Parfitt Bros.

Magnolia St., s s, 175′ e Central Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,500; owner and builder, Fr. Keiser, Magnolia St.; architect, Frank Holmberg.

Cedar St., s s, 26′ 4″ w Myrtle Ave., 3 three-st'y (brick-filled) store and tenements, tin roofs; cost, each, $3,500; owner and builder, Fr. Herr, 778 Broadway; architect, John Herr.

Berkeley Pl., n s, 100′ e Eighth Ave., 4 three-st'y brown-stone dwells., tin roofs; cost, each, $13,000, owners and architects, J. H. Doherty & Bro., 280 Flatbush Ave.

Guernsey St., e s, 102′ s Fourth St., three-st'y frame factory and 2 one-st'y extensions, one brick and one frame, filled in, gravel roofs; cost, $4,500; owner, architect and builder, Samuel Self, 142 Manhattan Ave.

Chicago.

BUILDING OUTLOOK. — Although architects are yet unable to furnish information of work decided upon they report a brighter prospect now than at this time last year. Stores and dwellings to be erected will be of more superior character.

STOREHOUSES.—Already five large store buildings are contemplated for the new Market — Jackson Street wholesale district, full plans having been drawn for three.

OFFICE-BUILDINGS.—Two tall office-buildings will probably be erected a short distance east, and other large buildings in that district will soon follow.

BUILDING PERMITS. — Arnold Bros., five-st'y storehouse, rear 149 and 151 West Randolph St.; cost, $16,000.

Andrew Johnston, 8 one-st'y stores, 773 to 783 West Madison St.; cost, $10,000.

New York.

BANK. — The Emigrant Savings Bank will erect at Nos. 49 and 51 Chambers St. a new building, to cost $300,000.

EXCHANGE.—The New York Stock Exchange contemplate alterations to their building, for which competitive plans are being prepared.

HOTEL.—The Grand Central Hotel is to be extensively improved by the new lessee, Mr. F. T. Walton, late of the St. James Hotel.

OFFICE-BUILDING. — Nos. 177 and 179 Broadway are to be altered and improved, at a cost of $25,000, from designs of Mr. Ferdinand Fish.

HOUSES. — On the s e cor. of Avenue A and Fifty-eighth St., 13 three-st'y and basement brown-stone houses, 16′ 8″ x 50′, are to be built for Mr. Theo. Schumacher, at a cost of $110,000, from designs of Messrs. Hugo Kafka & Co.

BUILDING PERMITS. — *One Hundred and Sixty-third St.*, n s, 310′ e Courtland Ave., one-st'y brick foundry-building, tin roof; cost, $6,000; owner, Francis Keil, 163 East Fifty-third St.; architect, C. Steinmetz.

Broome St., n w cor. Marion St., seven-st'y brick store, fire-proof roof; cost, $25,000; owners, Browning, King & Co., 408-412 Broome St.; architects, Wm. Field & Son.

West Twenty-ninth St., *No.* 220, five-st'y brick workshop, tin roof; cost, $9,000; owner, Mrs. Mary Smith, 136 West One Hundred and Twenty-second St.; architects, D. & J. Jardine.

Broadway, *No.* 545, extending through to No. 116 Mercer St., six-st'y iron store, tin roof; cost, $60,000; owner, Samuel Inslee, 410 Broadway; architect, S. A. Warner; builder, not selected.

Sixty-first St., s s, 100′ e Eleventh Ave., 8 five-st'y brick tenements, tin roofs; cost, each, $18,000; owner, Gotthold Haug, 1766 Third Ave.; architect, G. W. Spitzer.

Orchard St., *No.* 21, four-st'y brick store and dwell., tin roof; cost, $7,500; owner, Jacob Zimmermeier, 507 West Fifty-fourth St.; architect, M. L. Ungrich; builder, not selected.

Division St., *Nos.* 184 *and* 186, six-st'y brick tenement and stores, tin roofs; cost, $25,500; owner, Lewis Krulewitch, 192 Division St.; architect, Adam Munch.

One Hundred and Thirty-fourth St., n w cor. Brown Pl., 9 three-st'y brick dwells., tin roofs; cost, each, $4,500; owners, David T. Davies, One Hundred and Thirty-fourth St., s w cor. Brown Pl., and Anthony McOwen, Third Ave., cor. One Hundred and Fifty-fifth St.; architect, David T. Davies.

East Thirty-first St., *Nos.* 338 *and* 340, five-st'y brick factory, tin roof; cost, $14,000; owner, Fred. Bauer, 591 Broadway; architect, F. Jacobson; builder, Geo. W. Mulligan.

One Hundred and Thirty-fourth St., n s, 100′ e Eighth Ave., 4 four-st'y brick dwells., tin and slate roofs; cost, each, $9,000; owner, E. H. M. Just, 35 Great Jones St.; architect, M. C. Merritt.

One Hundred and Thirty-fourth St., n s, 161′ 6″ e Eighth Ave., 4 four-st'y brick dwells., tin and slate roofs; cost, each, $9,000; owner and architect, same as last.

Tenth Ave., e s, Sixty-fourth to Sixty-fifth St., 8 five-st'y brick tenements and stores, tin roofs; cost, each, $14,500; owner and builder, Henry J. Burchell, 58 East Fifty-third St.; architect, F. S. Barus.

Madison Ave., s e cor. Seventy-seventh St., six-st'y brick and stone apartment-house, brick arch roof; cost, $140,000; owners, Wm. B. and Ed. Franke, 1267 Broadway; architect, Wm. B. Franke; builder, Ed. Franke.

East Seventy-sixth St., *Nos.* 185 *and* 187, 2 five-st'y brick tenements, tin roofs; cost, each, $12,000; owners, S. T. Meyer & Son, 71 Broadway; architect, Arthur L. Meyer; builder, W. F. Lennon.

Tenth Ave., s w cor. Sixty-second St., 4 five-st'y brick tenements, tin roofs; cost, each, $18,000; owner, Gotthold Haug, 1766 Third Ave.; architect, G. W. Spitzer.

Hester St., *No.* 51, five-st'y brick tenement, tin roof; cost, $10,000; owner, Betisa Satenstein, 55 Hester St.; architect, Wm. Graul.

Grand St., *No.* 388, five-st'y brick tenement, tin roof; cost, $22,000; owner, Solomon Bachrach, 375 Grand St.; architect, Wm. Graul.

Centre St., *Nos.* 138 *and* 140, six-st'y brick and iron front building, metal roof; cost, $35,000; owner, P. Lorillard, 3 Mercer St.; architect, Jno. B. Snook.

One Hundred and Fiftieth St., s s, 70′ 3″ e Morris Ave., two-st'y brick dwell., tin roof; cost, $5,000; owner, William Morrissey, 416 East Thirteenth St.; architects, Berger & Baylies; builder, Peter Daly.

West Thirty-sixth St., *Nos.* 352 *and* 354, four-st'y brick school-house, tin roof; cost, $38,000; owner, City of New York Board of Education; architect, D. J. Stagg 146 Grand St.; builder, Wm. B. Pettit.

ALTERATIONS. — *Broadway*, *No.* 697, s w cor. Fourth St., interior alterations; cost, $5,000; owners, Wm. E. Davies, Demarest, N. J., and Isaac W. Maclay, 324 Palisade Ave., Yonkers, N. Y.

Broadway, *No.* 597, repair damage by fire; cost, $5,350; owner, Chas. C. Halsey, 13 East Seventy-seventh St.; architect and builder, Henry Wallace.

Broadway, *Nos.* 557 *and* 559, passenger-elevator, etc.; cost, $3,000; owner, C. E. Detmold, 27 West Tenth St.; architect and builder, Jno. Downey.

Maiden Lane, *Nos.* 41 *and* 43, six-st'y brick extension, old rear building removed, interior and front alterations to main building; owner, Chas. Knapp, on premises; architects, De Lemos & Cordes; builder, not selected.

Grand St., *No.* 271, n e cor. Forsyth St., new side wall, vault, balcony, interior alterations, new stairs, etc.; cost, $8,000; owner, Samuel Cohen, 281 Grand St.; architect, J. Boekell.

Third Ave., *No.* 1398, one-st'y brick extension, gravel roof; cost, $18,000; owners, Ed. D. Jones and W. J. T. Duff, 1417 Third Ave.; builder, John Farrell.

Gouverneur Slip, foot of Gouverner St., take down and rebuild easterly wall and internal alterations (to be fitted up for reception hospital; cost, $9,000; owners, City of New York Commissioners Charity and Correction, 60 Third Ave.; architects, N. Le Brun & Son.

West Thirty-third St., *No.* 372, raise roof and a four-st'y brick extension, tin roof; cost, $5,000; owner, Catharine Taylor, on premises; architect, A. E. Hudson; builder, not selected.

Eightieth St., n s, 209′ e Madison Ave., one-st'y brick extension, tin roof; cost, $3,000; owner and builder, Ed. Kilpatrick, 353 East Seventy-eighth St.; architects, D. & J. Jardine.

West Thirty-eighth St., *No.* 5, two-st'y brick extension, tin roof; cost, $1,000; owner, J. F. Degener, 28 West Twenty-ninth St.; builder, John Downey.

Philadelphia.

BUILDING PERMITS. — *North St.*, s s, between Fifth and Sixth Sts., rebuilding five-st'y store, 34′ x 95′; Marriner & Buckingham, contractors.

Forty-first St., cor. Haverford Road, workshop for Railway Co., 65′ x 160′; Samuel Hart, contractor.

Dickinson St., between Nineteenth and Twentieth Sts., 6 two-st'y dwelling-houses, 16′ x 42′; F. & P. Gallagher, owners.

Firth St., between Twenty-first and Twenty-second Sts., three-st'y dwell., 15′ 8″ x 42′; Jas. Gillen, owner.

Chestnut St., between Twenty-third and Twenty-fourth Sts., skating-rink, 112′ x 220′; H. L. Thompson, contractor.

Main St., between Allen and Arrolt St., one-st'y skating-rink, 60' x 180'; B. F. Hill, contractor.

Nice St., w of Township Line, two-st'y dwell., 16' x 26'; Wm. Garvin, owner.

St. Louis.

BUILDING PERMITS. — Sixteen permits have been issued since our last report, six of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows:—

C. H. I. A. Linky, two-st'y frame dwell.; cost, $4,000; contract sub-let.

Wm. Hoesner, 3 adjacent two-st'y dwells.; cost, $4,700; Ihlo & Dumeyer, builders.

General Notes.

ANNADALE, STATEN ISLAND, N. Y. — Memorial chapel, school and dormitory buildings, for Rev. A. J. Donnelly, of St. Michael's Parish, New York; estimated cost, $50,000; I. M. Merrick, architect, New York.

LONG BRANCH, N. J.— Contract entered into with C. V. Wilson, builder, for the erection of two cottages for Philip Daly, Esq.; cost, $26,550 for both; James Thornton, architect.

LOS ANGELES, CAL.—A State insane asylum is to be built here.

MILLBURY, MASS.—The Unitarians have bought a lot for $2,000, and are soon to build a church.

SHEFFIELD, MASS. — The plans for a memorial to the late Dr. Dewey, says the Boston *Advertiser*, have assumed a form such as he would have been apt to suggest had he been arranging a memorial for some friend whom he loved. The committee proposes to erect in the town of Sheffield, Mass., where he was born, and where he died, a simple building fit for the purposes of the Friendly Union Society of that town. This will be a public library and reading-room, will provide a hall for lectures, debates, and public amusements.

SIOUX FALLS, IO. — Buildings and public improvements at Sioux Falls last year amounted to $440,000.

PROPOSALS.

SCHOOL-HOUSE.

[At Morgan, O.]

Sealed proposals will be received by the Board of Education of Morgan Township, Butler County, O., for the building of a brick school-house in Sub-District No. 4, of said Township, **until 12 o'clock, noon, of the 12th day of February, 1885.**

Said board reserves the right to reject any or all bids.

Plans and specifications can be seen at the Township Clerk's Office in Okeana. 476

CANAL LOCK.

[Near Charleston, W. Va.]

UNITED STATES ENGINEER OFFICE,
CHARLESTON (Kanawha Co.), W. VA., Dec. 30, 1884.

Proposals for finishing Lock No. 2, of the Great Kanawha River Improvement will be received at this office **until noon, of February 3, 1885,** and opened immediately thereafter.

Blank forms and specifications can be had upon application at this office.

WM. P. CRAIGHILL,
475 Lt.-Col. of Engineers, U. S. A.

IRON ROOF.

[At Buffalo, N. Y.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 9, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 31st day of January, 1885**, for furnishing and putting in place the iron roof framing for the extension of the custom-house, etc., building, at Buffalo, N. Y., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
475 Supervising Architect.

COURT-HOUSE ALTERATIONS.

[At Preston, Minn.]

PRESTON, January 9, 1885.

The County Commissioners of the County of Fillmore, in the State of Minnesota, will receive sealed proposals **until the 25th day of March, 1885, at 12 o'clock, M.**, at the office of the county auditor, in the village of Preston, said county, for the remodeling of the county court-house in said village, and the building of 2 two-st'y brick additions thereto, and iron vaults therein, and the furnishing all materials, in accordance with the plans and specifications therefor on file in the office of said auditor, which can also be seen at the office of Mayberry & Son, architects, Winona, Minnesota.

No bids will be received except for the whole building complete as specified.

The successful bidder will be required to give a sufficient bond with sureties, within a reasonable time to be fixed by said commissioners, in the sum of $15,000, to be approved by said commissioners, conditioned upon the faithful performance of his contract.

Each bid must be accompanied by a sufficient bond with sureties, or a duly certified check payable to said county in a sum of at least five per cent of such bid, conditioned upon the giving the bond above specified within the time so fixed, provided such bid should be accepted. The work will cost several thousand dollars, and must be completed on or before the first day of November, 1885. Right reserved to reject any or all bids.

J. G. MINER,
Chairman Board of County Commissioners.
Attest: G. A. HAYES, County Auditor.
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PROPOSALS.

GLASS AND ENCAUSTIC FLOOR TILING.

[At Memphis, Tenn.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 10, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 5th day of February, 1885**, for furnishing and delivering, ready for setting, all the polished plate, polished plate ground, double-thick sheet, and double-thick sheet ground glass; and for furnishing and laying all the encaustic floor tiling required for the custom-house, etc., at Memphis, Tenn., in accordance with drawings, specifications, etc., copies of which (for each class) and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
475 Supervising Architect.

COURT-HOUSE.

[At Troy, O.]

AUDITOR'S OFFICE,
TROY, MIAMI CO., O., January 3, 1885.

Sealed proposals will be received at this office **until 12 o'clock, noon, of February 11, 1885**, for furnishing all the material and performing the labor necessary to erect a new court-house at Troy, in said County, according to plans and specifications on file at this office.

Bids must be made according to law, and must be accompanied by a bond (to be approved by the Board of Commissioners) for at least twenty-five per cent of the amount of the bid; the bond to be conditioned that if work is awarded, a proper bond and contract will be entered into.

The Commissioners reserve the right to reject any or all bids.

Blanks for bids and bonds can be had at this office, or at the office of J. W. Yost, architect, at Columbus, O.

Bids must be endorsed "Bid for Court-House," and addressed to HORATIO PEARSON,
475 County Auditor, Troy, O.

GLASS.

[At Kansas City, Mo.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 14, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 2d day of February, 1885**, for furnishing and delivering, ready for setting, all the polished plate and double-thick sheet, and double-thick sheet ground glass required for the custom-house and post-office at Kansas City, Mo., in accordance with specification and schedule, copies of which and any additional information may be had on application at this office, or the office of the local superintendent of the building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
475 Supervising Architect.

JAIL.

[At Scranton, Pa.]

OFFICE OF THE COMMISSIONERS OF LACKAWANNA COUNTY,
SCRANTON, PA., January 24, 1885.

Sealed proposals for the erection and completion of a county jail for Lackawanna County, to be located on the corner of Washington Ave. and New York St., in the city of Scranton, Pa., will be received by the undersigned Commissioners of said county, at their office **until Thursday, February 25, 1885, at 10 o'clock in the forenoon.** Plans and specifications will be on file at the court-house in the city of Scranton, on and after Tuesday, January 27, 1885. The builder to whom the contract shall be awarded will be required to enter into bonds with at least two approved sureties for the sum of $20,000, for the faithful performance of the contract. Work to be commenced within thirty days after the awarding of the contract, and to be finished on or before April 1, 1887.

The Commissioners reserve the right to reject any or all bids.

WM. FRANZ,
H. L. HALSTEAD,
WM. J. BURKE,
County Commissioners.
Attest: D. W. POWELL, Clerk. 478

STEEL CASTINGS.

[At New York, N. Y.]

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR,
WASHINGTON, D. C., January 2, 1885.

Sealed proposals, endorsed "Proposals for Steel Castings," will be received at this Bureau **until 12 o'clock, noon, on Tuesday, February 3, 1885,** when they will be opened in the presence of such bidders as may be present, for the steel castings of the turrets of the United States Steamship "*Miantonomoh*," as stated on requisition No. 108, from the New York Navy Yard, at which yard these castings must be delivered within three months after the contract is made, free of all expense to the Government.

The castings must in all respects conform strictly to the schedule for the same, which accompanies and forms part of the requisition, and will be subjected to a careful examination and inspection at the works, by an officer or officers detailed by the Department for that purpose, before being received.

Copies of the schedule and requisition will be furnished to those who are known to have the necessary facilities for doing the work, upon application to the Commandant of the New York Navy Yard.

The proposals must be accompanied with the guarantee required by law, that if the contract is awarded, it will be promptly executed, and the names of parties who are to become the sureties to the amount of the face of the contract will also be stated.

The Department reserves the right to reject any or all the proposals, as, in its opinion, the public interest requires.

T. D. WILSON,
475 Chief of Bureau.

PROPOSALS.

STONE AND BRICK WORK, ETC.

[At Erie, Pa.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 27, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 28th day of February, 1885**, for furnishing and setting all the stone and brick work for the superstructure of the court-house, post-office, etc., at Erie, Pa., in accordance with specifications and drawings, copies of which may be seen and any additional information obtained at this office or the office of the local superintendent of the building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
476 Supervising Architect.

CARPENTRY.

[At Cincinnati, O.]

OFFICE TRUSTEES TO REBUILD COURT-HOUSE,
HAMILTON COUNTY, OHIO,
CINCINNATI, January 21, 1885.

SOUTH COURT-HOUSE YARD.

Sealed proposals will be received at this office **until 9 1-2 o'clock, A. M., on Saturday, February 7, 1885**, for furnishing the carpenter and joiner work in rebuilding the court-house in Hamilton County, O., according to plans and specifications on file at this office and at the office of James W. McLaughlin, architect, Nos. 46 and 47 Johnston Building. The bids must be made on the blanks that will be furnished on demand by said Board.

The Board reserves the right to reject any and all bids. By order of the Board.

475 J. CLIFFORD GOULD, Clerk.

STONE AND BRICK WORK.

[At Lynchburgh, Va.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 27, 1885.

2 P. M., on the 26th day of February, 1885, for furnishing the labor and material, bricks, terra-cotta, stone, mortar, etc., and building complete the masonry of the walls of basement and superstructure of the court-house, post-office, etc., building at Lynchburgh, Va., in accordance with drawings and specifications, copies of which may be seen and any additional information obtained on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
476 Supervising Architect.

ROLLED-IRON BEAMS AND PLATE GIRDERS.

[At Washington, D. C.]

OFFICE OF BUILDING FOR STATE, WAR AND NAVY DEPARTMENTS,
WASHINGTON, D. C., January 22, 1885.

Separate sealed proposals for furnishing and delivering the rolled-iron beams and sixteen plate girders required for four floors of the west and centre wings of the Building for the State, War and Navy Departments in this city will be received at this office **until 12 M., on February 17, 1885**, and opened immediately thereafter, in presence of bidders.

Specifications, general instructions to bidders, and blank forms of proposal, for either the beams or the girders, will be furnished to established manufacturers on application to this office.

THOS. LINCOLN CASEY,
476 Colonel, Corps of Engineers.

LABOR AND MATERIALS.

[At Harrisonburg, Va.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 10, 1885.

Sealed proposals will be received at this office **until 2 o'clock, P. M., on the 24th day of February, 1885**, for furnishing all the labor and materials, including stone, bricks, woodwork, etc., required for the construction of the court-house, etc., building at Harrisonburg, Va., in accordance with drawings and specifications, copies of which, and any additional information may be obtained on application at this office or the office of the superintendent, on and after January 23, 1885.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
475 Supervising Architect.

GLASS AND ENCAUSTIC FLOOR TILING.

[At Jackson, Miss.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 10, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 31st day of January, 1885**, for furnishing and delivering, ready for setting, all the polished plate, polished plate ground, double-thick sheet, and double-thick sheet ground glass, and for furnishing and laying all the encaustic floor tiling required for the court-house, etc., at Jackson, Miss., in accordance with drawings, specifications, etc., copies of which (for each class) and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
475 Supervising Architect.

THE AMERICAN ARCHITECT AND BUILDING NEWS. JANUARY 31, 1885. No. 475.



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THE STATE CAPITOL, HARTFORD, CONN.

R. M. UPJOHN, Architect.

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CONTENTS.

THE profession of architecture in England has lost a most distinguished member in the person of Mr. John Whichcord, recently President of the Royal Institute of British Architects. Mr. Whichcord, as we learn from the *Builder*, was born in Maidstone, in the County of Kent, in 1823. His father was a successful architect in that town, and took his son into his office as a pupil immediately after his graduation from King's College, London. After four years of pupilage, young Whichcord returned to London for study at the Royal Academy, and, soon after, crossed the Channel for an extended tour on the Continent. Naturally of an adventurous disposition, he formed the project, on reaching Constantinople, of going in disguise about the towns of Asiatic Turkey, whose fanatical inhabitants resent so fiercely the intrusion of unbelievers as to make ordinary travelling dangerous. He therefore assumed the dress and manners of an Arab, and attached himself to a tribe, under whose protection he passed through the almost unknown region between the Bosphorus and the Euphrates. Thence he wandered to Syria, and, passing for a Mahometan, was admitted to all the mosques and holy places in Palestine without question. After several years of travel he returned to England, and entered into business, first in partnership with the late Mr. Arthur Ashpitel, and later by himself, constructing in the course of a long and prosperous professional career many important buildings, among them St. Stephen's Club-House at Westminster; the National Safe Deposit Company's building; the Grand Hotel at Brighton, and many banks and mercantile buildings. He found time in the midst of all his business to write a book on the "Polychromy of the Middle Ages," besides several other books, and many papers, on subjects of professional interest; and was an active member of various professional societies. In 1865 he was an unsuccessful candidate for Parliament, and in 1879 was chosen President of the Royal Institute of British Architects. Although he held this office only two years, he did much to maintain and extend the credit of the Institute, and was mainly instrumental in establishing the obligatory examinations which have already proved so valuable to the whole profession.

THE *Hydraulic and Sanitary Plumber* mentions two accidents, very different in character, but both due to the freezing of water in pipes; and at this season, when such freezing is an every-day occurrence, it is well to bear in mind the circumstances under which serious consequences may follow from want of care in dealing with the frozen pipes. In the first case a water-back in a range in the kitchen of the Metropolitan Hotel at Canton, O., exploded suddenly with terrific violence, tearing the range to pieces, and sending fragments of iron through the windows to a distance of several hundred feet, and throwing the cook, who fortunately escaped further injury, across the room. On investigation it was found that the supply-pipes were frozen, and the explosion was due simply to the pressure of the steam generated in the water-back, and unable to escape. We happened ourselves to observe a few weeks ago, a case in which a similar catastrophe, from precisely the same cause, was averted, as it appeared, only by an imperfection in the leather washer of a coupling, which gave way under the pressure, allowing the steam to escape freely enough to prevent further mischief; and every one who uses apparatus of any kind for distributing steam or hot water through pipes from a furnace or other heated point should, if the fire has been allowed to go down in cold weather, make sure before quickening it again that the circulation is unobstructed.

IN the second case, the freezing took place in the drip-pipe attached at a depression in a line of gas-pipe. In very cold weather, especially where the pipes are exposed, a good deal of liquid is condensed from ordinary gas, and settles in the lowest portions of the pipes, often causing the street-lamps and house-lights, beyond the depressed portion, either to go out altogether or to flare up and sink down alternately, as bubbles of gas are forced through the trapping liquid in the mains, to the just annoyance of those who use them. To prevent trouble from this cause, street mains are often provided with small wells at the low points, which collect the liquid, and keep it, out of the way of the gas current, until it can be pumped out, by a pump made for the purpose. For small pipes it is common to employ the simpler device of a drip, or short vertical pipe depending from the low point, with a cock at the bottom to draw off the accumulated liquid from time to time; and, as the condensed liquid is mainly water, such drip-pipes are quite likely to freeze. In this instance the drip, which was on a pipe in a house in Montreal, froze hard enough to burst not only the drip-pipe but the supply-pipe to which it was attached. The gas of course escaped very freely, and an explosion followed immediately upon the arrival of a servant with a candle to investigate the leak.

A SIMPLE device was recently patented for separating the water which first runs from a roof in rains from that which falls afterwards. Every one knows that where rain-water from roofs is collected in cisterns for use, the first few minutes of a shower, particularly after a long drought, give a muddy flow to the cisterns, on account of the mixture with the water of the dust from the roof; so that it is desirable to let the rain which first falls on the roof run to waste, and save only that which comes afterwards. A common way of accomplishing this end is to fit either a movable shoe at the bottom of the leader pipe, or a valve somewhere in its length, by which the current is thrown upon the ground until a change is made in the position of the valve or shoe, by which the water is directed toward the open mouth of the pipe leading to the cistern. The objection to this arrangement is that if the leaders are set to turn the water on the ground, some one must run out in the rain to shift them when the roof has been sufficiently washed; and if they are kept generally turned to flow into the cistern, showers at night may carry a great deal of dirt into the cistern, before those interested in the matter can get out to change them. The patented apparatus, though not quite automatic, has the advantage of not requiring attention while the rain is falling, if its proprietor will think to look after it when each shower is over. In substance, the apparatus consists of a barrel, or some similar receptacle, having a fixed cover, with a floating lid under it. A hole is cut through the upper lid, through which the rain-water passes from the leader; and an overflow-pipe, inserted in the side of the barrel above the fixed cover, extends to the cistern. A waste faucet is placed near the bottom of the barrel. The barrel should always be emptied before the commencement of a shower, and the floating lid will then lie at the bottom, leaving the hole in the cover free for the admission of the rain-water from the leader. The first drops which fall run into the barrel, and as this fills the floating lid rises, until it closes the hole in the fixed cover. The water is then diverted to the cistern, leaving the first flow, containing the washings of the roof, in the barrel, to be drawn off and thrown away at any convenient time.

ACCORDING to the *Architect*, an important series of observations upon dry-rot in timber have been made by a certain Russian professor. The most interesting of his discoveries, which will, we hope, be confirmed by the experience of others, is that a thorough draught of air will destroy the dry-rot fungus within a single day; and that if the exposure to a current of air is accompanied with the sunning of the affected

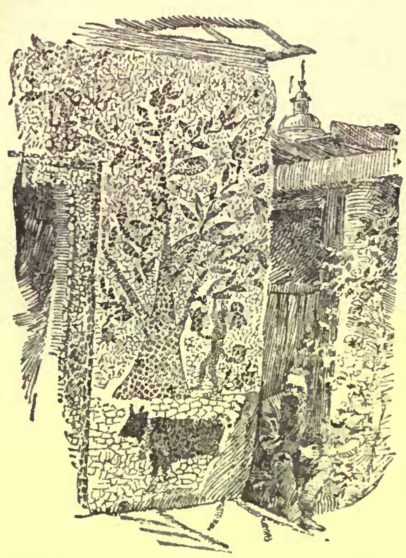
part, the parasite will lose its vitality in a few hours. A strong solution of common salt is extremely efficacious in checking the progress of the disease, as is also a solution of sulphate of copper, or of carbolic acid, or the aromatic tar obtained from birch-wood. The fact of the destruction of the dry-rot fungus by fresh air is of great importance, but it is very desirable that further investigation should show the limitations under which the action takes place. In the pure, though quiet air of the garret of a building with a slated roof we have known dry-rot to flourish and increase, although the place was as free from moisture as a room could well be; and it would be difficult to find a more airy or sunny situation than that of the timbers of a wooden railroad bridge, which are said to rot from the influence of the vapor rising from a stream flowing many feet below. Perhaps the size of the stick may have something to do with the result; and it is well known that the framing of one piece with the end grain in contact with the side of another strongly favors the rotting of both. The whole subject is of extreme importance, and we can hardly imagine any way in which one or two young architects or students could do themselves and the public more service in these dull times than by making a systematic investigation, aided, if possible, by the microscope, of the circumstances under which the dry-rot parasite, the *merulius lacrymans* of the botanists, lives and flourishes, or starves and dies. All the material is at hand in every house. If any one will take the trouble to fill a shallow wooden box to the depth of two inches with earth, making a little hollow in the middle, and will then set the box on the floor, and keep the earth damp by occasional watering, he will soon have an abundant crop of the merulius, which will spread from the wood over the earth on the sides of the little hollow, and will deposit among the particles of earth the tears, or globular clusters of spores, from which the fungus takes its name. With these spores the disease can be communicated, by inoculation, to the object set apart for testing. The infection can also be communicated in a different way, by such contact of a diseased with a sound piece as will allow the delicate threads which run through the substance of the diseased stick, often twenty feet away from the centre of the fungoid growth, to penetrate the sound wood; and a series of experiments should be conducted with reference to each mode of contagion. It would be well, among other tests, to try the effect in checking rot of admitting air to the interior of pieces of wood by boring holes in various directions through them, as is done for the sake of preventing unequal shrinking in oak and other compact woods; and the good or bad result of applying paint to the end of the grain, either by itself or in connection with painting the sides of the stick, should be carefully ascertained. To give an idea of the value of such experiments, intelligently conducted to a practical result, it may be mentioned that the present cost of preparing railway ties to resist dry-rot by the most efficient process now known is from thirty to forty cents each, or about eight hundred dollars for every mile of single track; and a method for preventing or delaying dry-rot as simple as that of admitting air to the interior, if it were found to be effective, would bring a fortune to the inventor, and relief from a serious burden to the stockholders of thousands of miles of railway.

ONE of the most important documents ever contributed to sanitary science has just been issued, in the shape of the final report of the English Royal Commission on Metropolitan Sewage Discharge. The Commission was appointed to inquire into the evils which were said to have attended the discharge of the sewage of London into the Thames, and, if they were found to be serious, to consider the best method of disposing of the sewage in some other way. In the performance of this duty the Commission not only examined the condition of the Thames, and the effect of the sewage in fouling and choking the stream, but studied all the practicable methods of sewage disposal, and its report not only gives a valuable summary of the results now attained in practice by different systems, but the conclusions reached by the Commission are of special weight, as they indicate a conviction that the vast sewage flow of London can be successfully dealt with by methods which have hitherto been applied only on a much smaller scale.

THE opinion of the Commission, as summed up at the end of the report, is that the evils arising from the present system of discharging the London sewage into the Thames, nearly ten miles below the city, are such as "demand a prompt remedy," and it considers the discharge of the sewage of the city in a crude state into any part of the Thames as "neither necessary nor justifiable." To purify the vast mass of liquid, the Commission advises the use of some process of precipitation, which could be applied at the present outfalls. The liquid remaining after the separation of the solids suspended in the sewage might be allowed temporarily to flow into the river; but as soon as practicable it should be further purified by intermittent filtration through land, and then allowed to flow into the river. The Commission further advises that in all future drainage works the sewage "should be, as far as possible, separated from the rainfall." Notwithstanding the enormous amount of the London sewage, the Commission believes that land enough for purifying it can be had, at reasonable cost, within a convenient distance of the outfalls. The disposal of the sludge deposited from the sewage would be a rather serious matter, but the Commission can think of nothing better to do with it than to have it "applied to the raising of low-lying lands, or burnt, or dug into land, or carried away to sea." None of these seem to be very satisfactory solutions of the problem. Low-lying lands filled up with sewer-mud would, we should say, be anything but favorable to the health of those who lived on or near them; and all the other methods of disposal are costly, and bring no return whatever. It has often been proposed to make cement from sewage sludge, and good cement has actually been so produced, we believe, but the composition of the sludge must be too variable to make the process a certain one, and the Commission appears to ignore it altogether in its report. It seems not impossible that the sludge might be utilized for gas-making by some process yet to be invented, and this may prove to be, after all, the most profitable way of disposing of it. Much of the organic matter contained in it would yield hydrogen by distillation, and if some method were devised for decomposing, at the same time, the water contained in the moist precipitate, perhaps a form of water-gas might be evolved of some value for heating, if not for lighting, and the mineral residue, after the distillation of the gas, would be at least more desirable as filling material than before.

THE *Scientific American* quotes from the London *Times* an interesting account of a surgical experiment recently made with the happiest results at one of the English hospitals. A patient was recently admitted to the hospital, affected with a sort of paralysis which follows the formation of a tumor on the brain. Hitherto, such tumors have been looked upon as inevitably fatal, and nothing is usually attempted but the partial alleviation, by means of narcotics, of the patients' sufferings. Not long ago, however, it was discovered, through experiments upon animals that the different portions of the brain were connected with distinct groups of nerves running to other parts of the body, and that in case of lesions of the brain, the seat of the disease might often be ascertained by observing the manner in which the various nerves of motion and sensation were affected. By many trials with animals the connections of brain and nerves had been so clearly defined that operations on the brain had been successfully employed for affecting certain nerves corresponding to the portion of the head on which the operation was performed. No surgeon had, however, ventured to use this knowledge in treating a human subject; but Dr. Bennett, the physician in the present instance, having interested himself in trying to trace the locality of the brain tumors from the groups of nerves affected by it, became convinced that it was as yet of small size, and confined to a certain spot in the right side of the brain. Of course it was growing, and the fatal end of the disease could not be far off, but there remained a few days within which, judging from the results of the experiments upon the lower animals, it might be possible to reach and extirpate the tumor, the first in that situation which had ever been either cured or touched in a human subject. The case was then explained to the patient, and he was shown that on one side lay the certainty of a few months of increasing suffering, with death at the end; and on the other, a novel and dangerous operation, with a strong probability of fatal result, but affording on the other hand, a possibility of complete relief. The patient immediately chose to undergo the operation, and the skull was trepanned in the presence of a number of physicians at the exact spot which Dr. Bennett pointed out. Under the opening, as he predicted, was found the tumor, about the size of a walnut, and easily removed. The extirpation of the tumor was followed by immediate relief, and the patient was in a few days convalescent, with the prospect of many years of useful and happy life before him.

STROLLS ABOUT MEXICO. — IV.



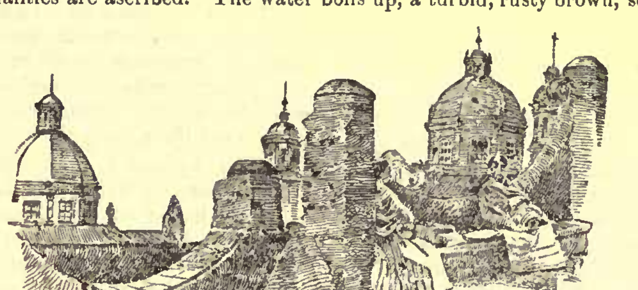
THE most famous of the suburbs of Mexico is the villa Guadalupe, the scene of the most popular legend of the Catholic church in the New World. This was the apparition of the Virgin, on the hill of Tepayac, to a poor Indian, Juan Diego, in the year 1531, a little over ten years after the Conquest. The marvelous tale spread rapidly and received universal credence throughout Spanish America. Nuestra Señora de Guadalupe, Our Lady of Guadalupe, became the patron saint of Mexico. In her name the struggle for Mexican independence was conducted. The legend of Guadalupe has never, I believe, received the sanction of Rome, but neither has it been disapproved, for it may almost be called the corner-stone of the church in Mexico. Immense treasures have been lavished upon the spot, a remarkable group of shrines has been established, and every year, on December 12, the anniversary of the Virgin's appearance, vast multitudes from all parts of the republic throng thither to do homage to their saint. Guadalupe is one of the favorite given names in Mexico, and it is applied to males as well as to females.

The tramway cars run out to Guadalupe every half-hour, and it takes about half an hour to get there. The road is a straight, broad causeway running near and parallel with the railway from Vera Cruz, which enters the capital over the ancient causeway. When I first came to Mexico over that route, I was puzzled at the sight of large sculptured tablets standing beside the track, seen for an instant through the gloom of the evening as the train dashed past. It seems that they were the twelve "stations of the cross," erected for the devout pilgrims to Guadalupe, but rendered useless through the occupation of the old causeway by the railway tracks.

When within a few minutes of the villa, we pass the mineral spring and thermal baths of Guadalupe. People come out from the city as early as five o'clock in the morning to bathe here. The spring boils up in considerable volume in a basin amidst a pleasant garden. The water, which is aerated and strongly impregnated with iron, has an agreeable taste.

The great cathedral church has a large open space in front and on one side; it is chiefly of brick. Its proportions are noble; it has a dome and four towers at the corners. The great interior, with tall columns and beautiful arches, is impressive, but its venerable dignity is somewhat impaired by the spic-and-span newness of its decoration of glossy white and glittering gold.

A charming little garden adjoins the cathedral chapel and the tramway station. The heights of Tepayac, crowned with a chapel, rise picturesquely beyond. Crossing this garden, we come to a circular edifice capped with a dome of glazed tile laid in zigzag pattern. This is the chapel of the sacred well, to which miraculous qualities are ascribed. The water boils up, a turbid, rusty brown, so



uninviting in appearance that strangers, unless led by devotion, generally refuse to drink. The taste is, however, not unpleasant, and the color comes from the large quantity of iron held in suspension.

In this neighborhood the ground is covered with the wares of pottery-venders made in this neighborhood; the pottery is a dark-brown, glazed, and is distinguished by its graceful shapes. Among the various vessels are some curious ones made in the shape of ducks.

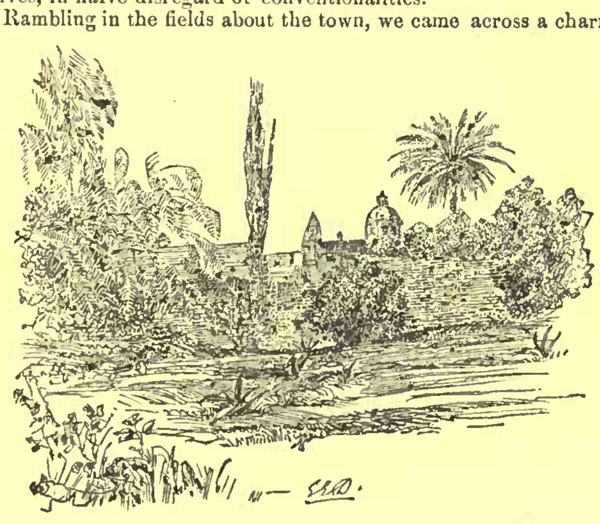
Across the way from the chapel of the sacred well, a long flight of irregular stone steps ascend to the chapel on the hill. These steps command beautiful prospects; they are guarded, here and there, by massive walls with inverted arches, which, with the neighboring domes and towers rising above the housetops of the town form effective bits of composition. A queer monument stands near the summit: the prow, mast and sails of a ship are reproduced as faithfully as possible in stone. It was built by a Spaniard many years ago, having, when in great danger from a storm at sea, vowed to the Virgin of Guadalupe that, if he should reach land in safety he would erect this monument in thankful commemoration.

The chapel at the summit is not particularly interesting architecturally, but is ennobled by its magnificent site, which commands a far-reaching view over the beautiful valley and the neighboring great city. The pulpits in the interior are of elaborately and gracefully carved wood. This chapel occupies the site of the shrine of Tenontzin, the goddess of the field and of corn, a mild Aztec deity who rejected human sacrifices, demanding doves, fruits and flowers. It was on this mountain that Juan Diego found growing the miraculous roses which, when he showed them to the archbishop, left the print of the image of the Virgin of Guadalupe on his apron. Possibly it was for the reason of this being the site of the shrine of the mild goddess that the shrewd Church fathers chose it as the place for the apparition of the gentle Virgin whom they desired to see supplant the former in the affections of the natives, tenacious of their ancient faith.

We descend the hill by a tortuous path on the other side. Upon the slope we come to a house where we pay six cents for the privilege of seeing the wonderful garden in the rear. We enter and stand amazed in the presence of a gorgeously glittering scene which appears like the transformation piece of a fairy spectacle at the theatre. It is on the rugged side of the hill, and the rocks are completely encrusted with a gay mosaic of broken colored crockery, such as might be obtained from innumerable mugs of the "For a Good Boy" style. These mosaics are arranged in decorative designs, and the whole covered with clambering vines and with a profusion of blooming plants all about, makes an effective though bizarre sight. The side of one building is covered with this mosaic-work, showing figures of a cow and a monkey beneath a tree.

Back of the town a massive aqueduct comes winding in from the mountains. It terminates in a richly sculptured fountain, dilapidated with age. The water pours down in clear cascades, forming a pleasant brook with grassy banks. Here, of a Sunday, crowds of Indians of both sexes may be seen washing their garments and bathing themselves, in naïve disregard of conventionalities.

Rambling in the fields about the town, we came across a charming



view of the cathedral in the distance, with its dome and towers filling in the vista between a poplar and a palm.

There are pleasant suburbs all about Mexico. The favorite spots for country homes are Tacubaya and San Angel. Tacubaya lies to the westward of the capital, a short distance beyond Chapultepec. It is a city of about eight thousand inhabitants. Lying on the slopes of the foothills, it is well drained and has pure air. Many houses here have beautiful grounds, which, however, are not visible from the streets, being either in the rear of the dwellings or enclosed by high walls, as in most European suburbs, affording only chance glimpses through the barred entrances. Suburban life in Mexico was in disfavor for many years, owing to the prevailing insecurity and the difficulty of communication; but with the construction of the tramway lines, and with the growing security of an era of peace and tranquility, it is growing in favor. Many cultivated people live in Tacubaya the year round, and many others have summer homes there. A new suburb is growing rapidly on the Castañeda hacienda at Mixcoac, between Tacubaya and San Angel. The lots there are sold on the instalment plan.

There is a handsome street leading up to the barracks in Tacubaya, between shady gardens where roses garland the high walls. A strip of delightful pleasure-ground, through which a clear brook swiftly runs, ornaments the street in front of the barracks, and here

the fine battalion band frequently plays. Farther up the street there is one of the grandest views of the two great snow-covered volcanoes to be had in the Valley of Mexico.

The picturesque forms which all work of man seems involuntarily to assume in this country was exemplified in a brick-kiln which I came across in a stroll about Tacubaya. It was set in the midst of a field of maguey, and its proportions could hardly have been finer



had they been intentionally designed for effect: particularly happy was the strong arched doorway, with rich, deep shadow.

San Angel is also in high favor as a summer residence, but it does not contain such valuable estates as some of those in Tacubaya.



The houses used for summer homes only are generally barely furnished, for a sort of camping-out life, but it is difficult to judge the interior of a house by its external aspect. San Angel lies near the mountains, in a charming situation. It is surrounded by market-gardens with a profusion of fruit and flowers. The hedges about the Indian huts in the neighborhood are generally a tangle of exquisite roses, and in the early morning the second-class cars going into the capital are embowered with flowers for the market. Strawberries are grown here in abundance, and are to be had nearly throughout the year.

Other pleasant suburbs are Thalpam, about twelve miles out to the southward, near the foot of the lofty mountain, Ajusco, and Atzcapotzalco, lying northwesterly from the city. An American friend never could master the difficult orthography of the latter place, which he always referred to as "that name on the street-cars."

Sylvester Baxter.

The Bastien-Lepage Exhibition and our Customs Laws.—Another illustration of the queer position which we occupy in matters of art is furnished by a lately published paragraph about the Bastien-Lepage exhibition to be held in Paris. It is well known that one of the most celebrated pictures by this lamented young painter, the Joan of Arc, is in this country, in the possession of Mr. Erwin Davis. Naturally it is the desire of the committee to obtain the loan of this masterpiece, and Mr. Davis is reported to have generously consented. Owing, however, to the state of our tariff laws, the picture, having once before paid 10 per cent duty on its first entry, will have to pay another 30 per cent on its return, which, together with packing and transportation charges, will make necessary an expenditure of about $4,000, all of which Mr. Davis is said to have declared himself willing to bear. That is a pretty heavy penalty to pay for the crime of enabling one's poorer countrymen to see an important work which otherwise they might never have seen, and being desirous of doing honor to the memory of a deceased artist. Put this and the former item together, and add as a sweetening the Pedestal Fund scandal, and who will dare to deny that we are a great people?—*New York Mail and Express.*

ELECTRIC-LIGHTING.



TEN years ago the electric arc was known to most persons only in laboratory experiments, performed occasionally to illustrate of the power produced by a large number of galvanic cells; and the incandescent light, as now known in commercial use, was regarded as a visionary idea of learned experimenters. At the present time the arc light may be seen in almost any large town in the United States, while the incandescent light is already becoming a rival to gas in large factories and in some of our large cities. The factor which has produced this great change is the discovery of the dynamo-electric generator commonly known as the "dynamo." By means of this machine it has been found possible to produce large quantities of electricity, in what may be called commercial form, at a comparatively small cost. A dozen years ago the galvanic battery was, to most people at least, the only means of producing a useful current of electricity, while now the "dynamo" is looked upon by any one at all conversant with the subject as the best method of producing any large quantity of electricity. There are two essential parts to this machine: a number of electro-magnets for producing what is known as a magnetic field, and a number of coils of insulated wire attached to a spindle or axle, by means of which they can be revolved close to the electro-magnets, and consequently in the magnetic field. The result of the motion of these coils through this magnetic field is a current of electricity varying in quantity and pressure or tension according to the variation in the amount and size of the wire in the revolving coils and field magnets, the speed at which the axle turns, and the manner in which the coils are wound. The axle and coils attached to it are known as the armature, and to the end of the axle is attached a series of metallic strips for bringing together the currents produced in the coils; this is called the commutator, and from it the combined currents are led to the metallic conductors, which convey them to the point where they are to do their work. In electric-lighting, these conductors are usually made of pure copper, because this metal offers comparatively little resistance to the passage of the current, or, in electrical language, has a high conductivity. They are also carefully insulated, or separated from all foreign substances which might divert the current from its proper course, and in some cases cause serious danger from fire.

The lamps which are used in connection with the electric current for producing light are of two kinds, the "arc" and the "incandescent" lamp. The arc-lamp employs the electric arc which is formed between two carbon pencils withdrawn a slight distance from each other during the passage of a powerful electric current, and consists merely of mechanism for producing and maintaining the proper distance between the carbon pencils, which serve very much the same purpose as the wick in an oil-lamp, as they convey the electric current to the point of combustion. They differ from the wick in that they furnish the material for the combustion, while the main source of the combustion in a lamp is the oil which the wick brings to the flame. The particles of carbon which furnish the light in an arc-lamp are torn off by the current in its passage, and heated to the greatest known degree of artificial heat by the process of tearing off, thus producing the very brilliant light with which we are all familiar. The objections to the use of this light are three: first and chief, there is great trouble in keeping the light at all steady, either in color or illuminating power; second, the carbon pencils have to be renewed after burning seven or eight hours, although there are some lamps in which a second set of carbons is automatically brought into the circuit when the first set is consumed; and third, the very brilliancy of the light and the small size of the point from which the light radiates make the shadows of things near the light very large and very black. This is especially noticeable when one compares them with the large incandescent-lamps which are now coming into use, and which give a very steady and evenly-distributed light, and which seem likely to supersede the arc light for interior lighting, though the greater power of the arc-lamp will make it a better illuminant for outdoor work, and perhaps for some large buildings, where steadiness of light is not important.

The incandescent light is, when properly managed, the steadiest light which can be produced, and should burn from five hundred to a thousand hours before needing renewal. The light in them is not produced by combustion, but by the glowing of a very fine strip or filament of carbon, which is heated to a high degree by the passage of the current through it, but is not consumed, as it is in a vacuum in which there is, of course, no oxygen to complete the combustion. There are several kinds of incandescent-lamps, of which the best known are those invented by Mr. Maxim, Mr. Edison and Mr. Swan, but they differ only in the manner in which the carbon filament is prepared, as they and all other incandescent-lamps now in use

consist of a glass globe in which the filament is placed, and from which the air is exhausted as completely as possible. To the ends of the filament are attached platinum wires, which pass out through the glass and serve to attach the lamp to the electric circuit. These lamps give off very little heat, and can be handled at any time while heated. The position of the lamp, moreover, does not at all affect its brilliancy, and it is thus possible to use it in forms and in places where a lamp giving much heat or depending on an upright position could not be used. The Edison Company in particular, have made festoons of these lamps placed in and among colored globes, so as to look like great masses of glass flowers brilliantly illuminated from within. Another advantage of the incandescent light is that it consumes no oxygen and does not give off carbonic acid gas, which renders the air so injurious in large halls or offices lighted by gas. In Boston, for instance, several banking-houses have used this light for some time, and find it makes a visible difference in the character of the air in their offices, which before became disagreeable a short time after work began in the morning.

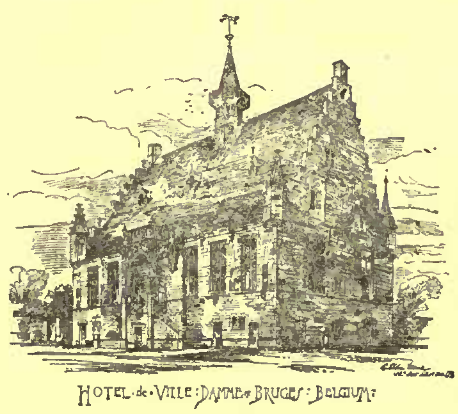
These lights are now made of several sizes varying from the power of ten standard candles to that of three or four hundred standard candles. To compare them with gas we may say that a sixteen candle-power lamp is about equivalent to a six-foot gas-burner with a flat flame on Boston gas. These can be produced within one thousand feet of the source of power with an expenditure of a fraction more than one-tenth of a horse-power apiece, and the amount of power required is only slightly increased when the lights are placed within a mile or two of the source of power. It is, however, necessary to increase the size of the conducting wires in proportion to the distance, so that lights used at a long interval from the dynamo-machine require a larger expenditure of money per foot for conducting wire than those nearer. Thus the conducting mains of the Edison Illuminating Company in New York City are of solid copper, and about an inch in diameter; it is necessary to lay two of these to complete the circuit, and it is easy to see that there must be a very large amount of copper in each mile of circuit. In spite of this large expense it seems likely that in our large cities these lights can be furnished in large quantities at very nearly the same price we are now paying for gas, and this is quite as true of other lights, as it is of those manufactured under Mr. Edison's patents. In many of the large manufacturing establishments incandescent lights have been introduced with the most favorable results, as from the absence of heat and smoke they can be placed where it would be impossible to put a gas-flame, and thus can be brought to throw the light more exactly where it is needed. Here again the increased purity of air is a great gain, as any one who has been often in mills will know; and where the lights are produced by the same power that drives the mill they can be very cheaply furnished.

There is a general feeling that there is necessarily a great risk both to human life and to property from the use of the electric light; but this feeling is not at all justified by facts. It is undoubtedly the case that if not carefully handled, or if conducted by improper apparatus, electricity can do much damage; but I believe less loss has been caused by electricity during the past year than by either gas or kerosene, taking each in the proportion of the amount of light furnished; and this too, in spite of the fact that electricity is an element of which we know but little, and which has come into use faster than any other illuminant. The arrangement of wires and other apparatus for securing freedom from danger in the use of electricity is a subject which has received much attention, and every electric-lighting company has rules, which, if rigidly adhered to, would make the danger from their lighting currents very slight.

In considering the problem of introducing electric-light into buildings the first question will usually be how to obtain the necessary current. In most of our large cities there are companies who make it a business to furnish electric current either for lighting or power, but in mills or in buildings so situated that the necessary current cannot be obtained from an outside source it may be necessary to obtain a dynamo and power to produce the necessary current. The essential thing in power for electric-lighting is absolute steadiness of speed, especially for incandescent lighting, and this is best obtained from a water-wheel if one can be had, and next to this the power produced by a high-speed engine, as in these the decrease in speed at each end of the stroke is less than in an engine making a long slow stroke. When the current is furnished by a local company, it is usual to have them do all work of putting in wires and fixtures, and I would advise all persons intending to have wires put into any building to employ the services of an electric company for this work, and not to entrust it to men who are only accustomed to wiring for electric call-bells, gas-lights, and the like. The work of putting in wires for electric-lights is a very different matter from any other kind of wiring, and requires a knowledge of electrical resistance, and of the heating power of lighting currents which most of the bell-hangers by no means possess. In one house which I was asked to inspect quite recently, part of the work was done by men quite competent to do the wiring for electric-bells and gas-lights, but in wiring for incandescent lights they had used nearly twice as large a wire in some places as was necessary, and in others had gone to the other extreme and used wire much too small. They had also placed the wire in such a way that a fire would have been almost inevitable had the wires ever been used for electric-lighting. Another caution seems appropriate in this place: in placing wires out of sight, it is much better to put them in grooves in a board coming flush with the surface of the finished wall, and to cover the grooves with a strip of moulding fastened on with screws, so that it can be easily taken off at any time to get at the wires. The reasons for this way of putting in the wire are, first: it is always desirable to be able to see any part of the wire some time after the building is completed, and if it is put behind the plastering this becomes impossible without cutting it in many places; in the second place wire run in grooves in this way is much more likely to keep its insulating covering perfect than if it is exposed to the moisture which often collects on brick or stone walls, and which is always present in fresh mortar. I cannot express too strongly the feeling I have against concealed wires for electric-lighting, in connection with the risk of fire. When wires are in plain sight any trouble on them will probably be noticed before it causes fire, particularly if inside buildings, but with concealed wires it is very difficult to discover any disarrangement before the wire gets to a dangerous state. All wire for electric-lighting should be protected by a covering not easily removed and not inflammable. Parafine should be particularly avoided in the insulating covering, as rats are very fond of this substance, and are likely to gnaw the covering off the wire to obtain the parafine.

In all wiring for incandescent lights it is usual to introduce pieces of metal of low fusing point which will be melted off by any injurious excess of current, thus destroying the circuit, and stopping the flow of the current before the conducting wire is unduly heated. These pieces of metal are called "safety strips," and are put in where the conductors leave the dynamo, and wherever the wire branches. All circuits whether for arc or incandescent lighting should be kept carefully away from water-pipes, gas-pipes, and other metallic bodies likely to make a connection across the wires or from one of them to the earth, and should so be placed that there shall be no danger to the insulating covering from tables, chairs, or other movable objects. If the precautions noted here are observed, and the wires and dynamos installed by persons familiar with this kind of work, and the whole handled in accordance with directions obtained from them, I believe electricity to be the safest method of illumination yet discovered. F. ELLIOTT CABOT.

ON THE LOIRE.



HOTEL·de·VILLE: DAMME·BRUGES: BELGIUM.

IN the afternoon of a faultless summer day we are steaming rapidly over the smooth waters of the lower Loire. For the last hour or two we have been stopping at or passing picturesque French villages, the houses clustering down almost to the water's edge, or sheltered behind rows of trees; the inevitable café lies close to the wharf, its little outside chairs and tables deserted, as the steamer stops at the pier, and their occupants join the throng of peasants, men, women and children, who evidently regard its coming as the event of their quiet day. Church spires and towers dominate the scene at intervals as we glide along, and more than one large *fabrique* testifies that a lot of work is done on the river. Steamers and barges come and go, the banks on each side become more thickly populated, the buildings increase in number and in size, till, as the afternoon wanes, we run between a lofty cliff covered with houses on one side and an island with busy ship-yards on the other, and we are at Nantes, the Manchester of France. No approach to a city could be happier. As the houses rise terrace upon terrace, with the dome of a church here, the towers of the cathedral there, and handsome public and private buildings along the quays, the impression is a very favorable one. We have some distance to go, also, ere the steamer comes slowly to her berth, and ever as we advance, the views become more interesting. It is a handsome town as seen under the light of the warm afternoon sun, and there is a freshness about the character of the streets which promises well for a closer inspection. At present, however, we are most interested in getting a comfortable lodging, and, as the steamer comes to a standstill, and our traps are seized by the ever-ready porter, we come to a little understanding with him and tramp off in his wake to a hotel. Along the quays we trudge, over a bridge, past the pillared Bourse and the brand-new post-office, till our guide, stopping at a little hotel overlooking the Canal St. Felix, we are ushered upstairs, and from the windows of our room what a prospect! Before us is the glory of Nantes, its château, a high group of buildings surrounded by a moat and protected by great circular bastion towers and hoary walls. Fortress, palace, prison, barrack, it has been all in its time, and the whole history of the town seems written on its face. How we thank our friend, the porter, for such a lucky choice! how we long for the morrow, when we can get inside! We feel almost impatient of the time taken up by dinner, that we may sally forth to inspect its formidable-looking exterior. The trim French waiting-maid does not

hurry, however, and, ere this can be done, the day is fading into a glorious, golden purple twilight, slowly but surely changing every minute, under the increasing silvery radiance of the full moon. The view of this grand old château on the quay, the gray cathedral towering over it on the high bank above, the long rows of trees in the Place St. Pierre, with the upper town beyond, all bathed in this golden evening light, make up a picture never to be forgotten. As we sit between the lights, and watch the changing tints in the cloudless sky, each pinnacle and turret of the old cathedral stands out sharp and clear in the wonderful atmosphere. Anon the moonlight obtains the mastery, we quit the fairy-like scene and wend our way into the lamp-lit streets.

When we come to inspect the château next morning, we find it a cluster of buildings surrounding a court-yard of irregular shape, approached by a draw-bridge over the moat. It was founded about the tenth century, but has been mostly rebuilt by Duke Francis the Second, about 1466, though some of the towers are older. The principal block of buildings on the right of the court-yard is now used as a barrack; it dates from the sixteenth century, but has been recently restored under M. Ménard. It is chiefly remarkable for the staircase-tower at one end and the splendid series of dormer-windows along the flank. They remind one of the better-known examples at the Palais de Justice at Rouen, being similar in style and with equal richness of detail. Nearly opposite this barrack is the armory, and between them, but at right-angles, is the chapel. This chapel is late fifteenth-century work, but has been so much restored that a good deal of the old character has vanished. Here the Duchess Anne of Bretagne was married to the French king, the château being a favorite residence of the Dukes of Bretagne. In the court-yard is a famous well, covered with a splendid canopy of wrought iron-work, which fortunately the hand of the restorer has not yet touched. Historical incidents of many kinds crowd each other in such a place as this: we can only mention such names as De Retz, Froquet, the Duchesse de Berri, Henry IV, Mme. de Sevigné, in addition to the great duke and duchess before mentioned, as a few of those whose presence haunts the spot.

Next in interest to the château is the cathedral church of St. Peter. It is very good fifteenth-century work, with two west towers and three very fine doorways in the west front. The detail throughout is stronger and better, and the whole style less flamboyant than one usually finds in French work of this date. The fifteenth-century builders seem to have stopped short at the crossing, as the choir, with its fine apsidal chapels, is only now being finished. It has been carried out in the same style and with the same detail as the nave: the architect has cleverly caught the spirit of the old work in the most satisfactory manner. We regret his name has slipped from our memory, as this choir is certainly the purest and best modern French Gothic work it has been our lot to see. In spite of the teaching and the brilliant example of the great Viollet-le-Duc, the French architects have never taken kindly to the Gothic revival; but here the old work seems to have been faithfully studied, and with the happiest result. When finished, the church will be one hundred and two metres long; the old nave is twenty-five metres broad by about thirty-seven metres to the crown of the vault, and the towers are sixty-three metres high. The remains of the old twelfth-century choir have been laid bare during the operations; and a most interesting apsidal crypt, with its pillars and arches, is now opened up below the floor-line of the new choir. There must also have been a tower over the crossing at one time, as the piers are of great strength. It is curious, also, to observe at this point the work of several generations of builders. We have twelfth-century shafts and capitals and indications of arches; restorations and additions to them in the fourteenth and fifteenth centuries, and again with Classic mouldings and details of the seventeenth century; and lastly, a low-domed plaster ceiling of about the same date, and painted with figure-subjects. This, we presume, will be all cleared away when the new choir is thrown into the church: regretable, perhaps, but necessary.

The most remarkable monument is that of Francis II and his second wife, Marguerite de Foix, in the fourth transept. It is an altar-tomb, built in 1507 by Michael Colomb; has recumbent figures of the Duke and Duchess on the top of the slab, with allegorical figures at the angles, and small statuettes in a kind of arcade round the sides and ends. Though late in style, the detail, Renaissance in character, is good, and the whole work is exceedingly well carried out. In the north transept is the classic monument of General Lamoricière, built in 1879, from the designs of M. Boitte, architect, the sculptured figure by M. Paul Dubois, sculptor. Under a marble slab, which is supported by pillars of colored marbles, lies the figure of the General, while at the four angles are statues in bronze, representing the four great virtues. It is an admirable work, and while following the lines of the old altar-tombs, is thoroughly Classic in feeling, and very carefully detailed.

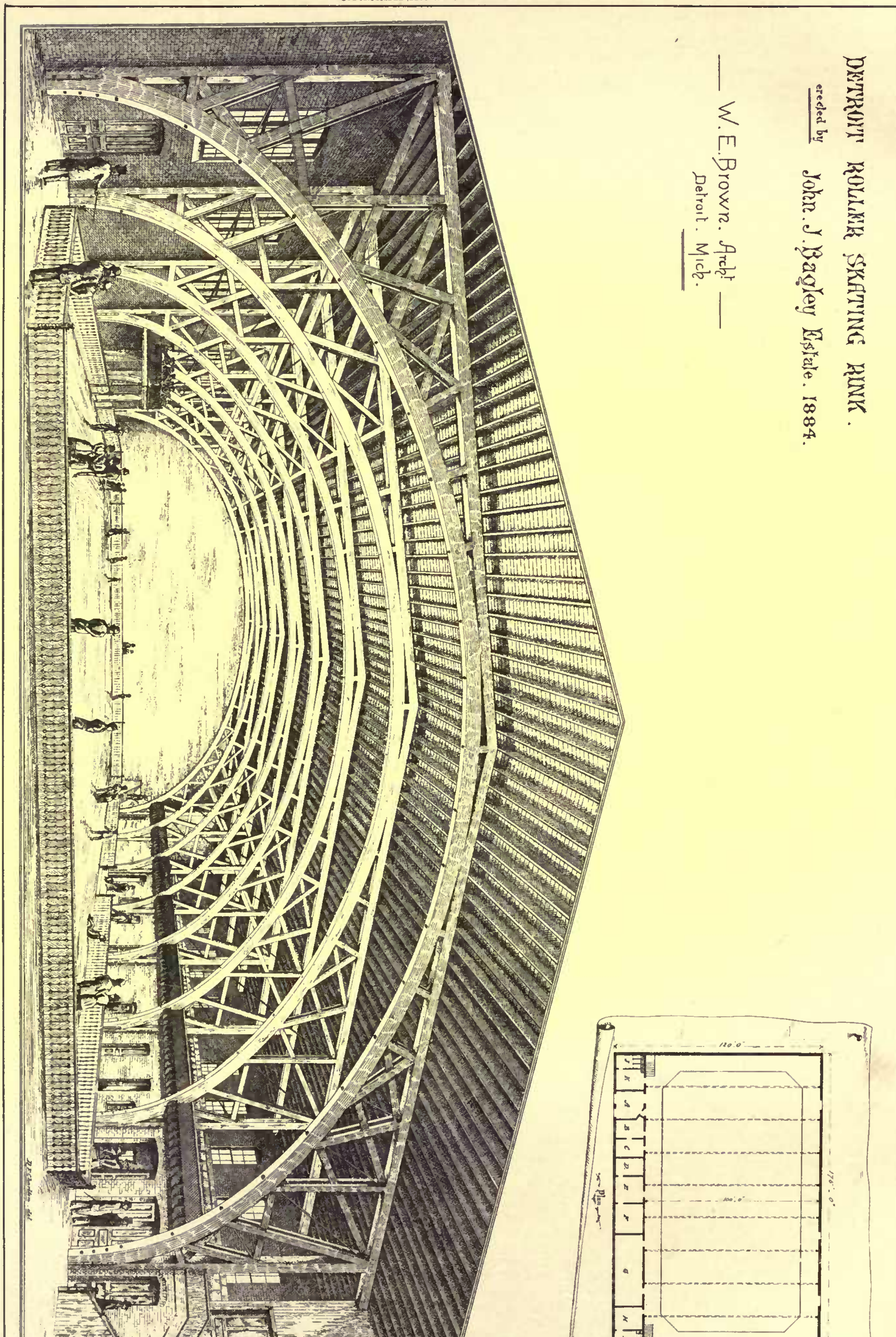
The most important church, after the cathedral, is that of St. Nicholas. It is a new church, from the designs of M. Lassus, Early French Gothic in style. It consists of nave and aisles, transepts and apsidal choir, with five chapels. It has a high clerestory and triforium all round, and is vaulted throughout. It has a western tower and spire eighty-three metres high — one of the landmarks of Nantes — and a small *flèche* at the crossing. It is a large, ambitious church, fairly well carried out, correct enough as to style, but hard and lifeless as most modern French Gothic usually is. Its details lack the careful study which is so noticeable in the new choir of the cathedral, and, though the church is impressive from its size and great height, when one begins to look closer into the work, it is not nearly so satisfactory. The painted glass in the choir, also, is poor stuff, compared with the best of modern English work of the same style. This church is only another proof that French architects of to-day are much more at home in Classic than they ever will be in Gothic. A walk down the street to the church of Notre Dame de Bon-Port still further confirms this impression. It is a Classic church, with a fairly good dome, and was built about 1846, from the designs of M. Chenantais. The dome is another of the landmarks, and forms a striking feature as seen from the river. In plan the church is a Greek cross, the dome being carried on four great arches. The eastern arm is the choir, the north and south arms the transepts, and the western arm, slightly prolonged, is the nave. Internally the church is architecturally simple to a degree, but it is enriched with much painted decoration in the way of figures and ornament of a very second-rate character, which goes far to destroy the otherwise good proportions of the interior. In spite of this, one feels the architect is at home in the style in which he is working, and the result is therefore more satisfactory than the would-be thirteenth-century stuff at St. Nicholas.

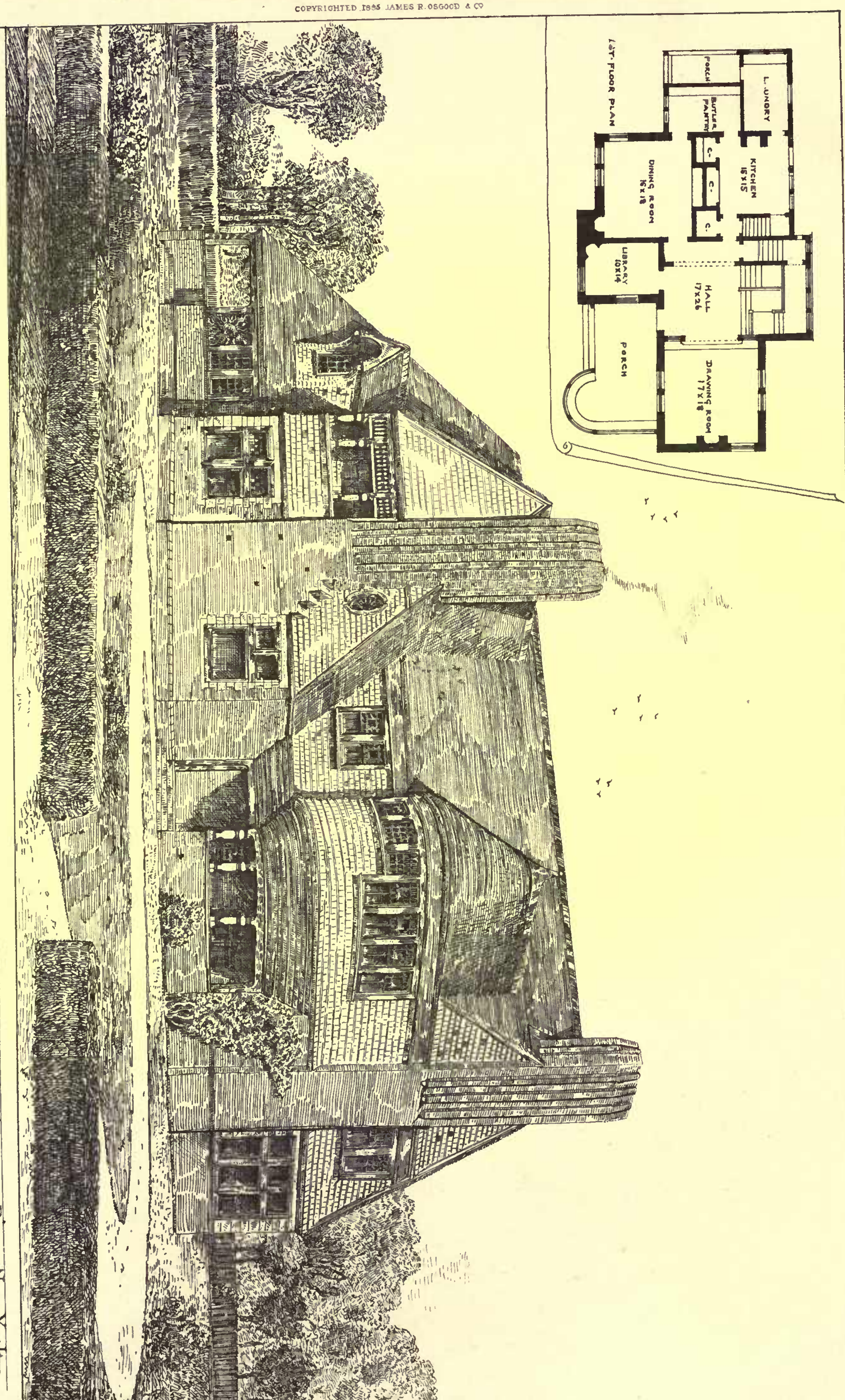
Among the public buildings the Grand Theatre is one of the most noteworthy; it was built by Mathurin Crucy in 1788. It has a fine octostyle portico of Corinthian columns, supporting an entablature and an attic; on the latter are placed *eight* statues of the Muses, the *ninth* we are told "found a refuge in the Bourse!" The interior of the theatre was destroyed by fire in 1796, but was rebuilt in 1811, restored in 1844, and again in 1863. It is considered the chef-d'œuvre of its architect, and one of the best theatres in France. If we mistake not the same architect built the great theatre at Bordeaux, which is certainly one of the finest in the country.

The Bourse just mentioned is also a fine structure. It is situated on the Quai de la Fosse, was built in 1792 to 1812, and contains the Tribunal and Chamber of Commerce. The west front has a fine portico of ten Ionic columns, surmounted by statues after the manner of the theatre façade, and in the same phase of French Classic their architects know so well how to use. Indeed the artistic treatment of this Classic work is one of the attractions of Nantes to an architect; it meets one everywhere, along the quays, in the streets and squares, in public and private buildings of all sorts and sizes; it is thoroughly at home, and notwithstanding the variety of its treatment it is never out of place. It seems indigenous, and what is more it gives the town an individuality of its own; it never apes Paris, as the newer parts of Brussels and Rouen do; it is always provincial, and so always interesting, giving Nantes the appearance of a well-built, well-to-do, handsome town. The traditions has also been well maintained. The new Rue de Strasbourg is a handsome street, and the new Palais de Justice built about 1850 is a monumental work with a rich colonnade and a fine staircase; it is also adorned with statues by M. Ménard. The new post-office on the quay, but recently completed, is thoroughly well-designed and has a business-like air quite in keeping with its purpose. The streets, especially in the older parts, say for instance from the cathedral to the theatre, are narrower than one expects to find in a town of its size, and the absence of any considerable wheeled traffic strikes a stranger. In the evening a carriage coming along the street is quite an event, and most of the people walk up and down the middle of the roadway. An arcade with three galleries, called Le passage Pommeraye, and built about 1843, is considered one of the sights of the town, but it is a poor affair after the great arcade at Brussels. A much greater attraction is the Museum of Painting and Sculpture containing something like one thousand pictures and one hundred and fifty statues, busts, bas-reliefs, etc. The pictures include examples of all the great schools: Italian, Dutch, Flemish, German, Spanish and French, and among the busts is that of Crucy the architect of the Grand Theatre. Besides the foregoing, there is the Archæological Museum, a collection of considerable interest, and there is a splendid public library, containing nearly one hundred thousand volumes, besides manuscripts, prints, pamphlets, etc., so that there is plenty to interest the visitor to Nantes.

It was the fine old château and cathedral, however, that proved the principal charm to the architect. The magnificent view of which they formed the principal features was the first thing our eyes rested on in the morning, the last thing at night, as we sat smoking in the little balcony of our room before turning in. Whether under the noontide sun, or bathed in the splendid moonlight, those grand old buildings were always impressive, always fascinating, speaking to us in tones far more eloquent than words. They were among the last objects on which our eyes rested as we ran slowly past them by rail, when we left the city on the way to St. Nazaire, as they will be ever the centre of the picture left in one's memory.

The country between Nantes and St. Nazaire is not particularly interesting. The undulating character of the scenery falls away as we near the mouth of the river. At Savenay Junction there is an interchange of traffic. Here are to be met "all sorts and conditions" of Bretons of the type we are fast becoming familiar with, particularly the peasants, a comely reliable race, who without any great claim to personal beauty, look strong and healthy and are always more or less interesting. Almost across the river from Savenay is Paimboeuf, a picturesque village close to the water side. So is Basse-Indre, a little higher up on the right bank. As we approach St. Nazaire the air is clouded with the smoke of tall chimneys, and resounds


DETROIT ROLLER SKATING RINK.
erected by John. J. Bagley Estate. 1884.
W. E. Brown. Archt
Detroit. Mich.
120' 0"
170' 0"
Plan

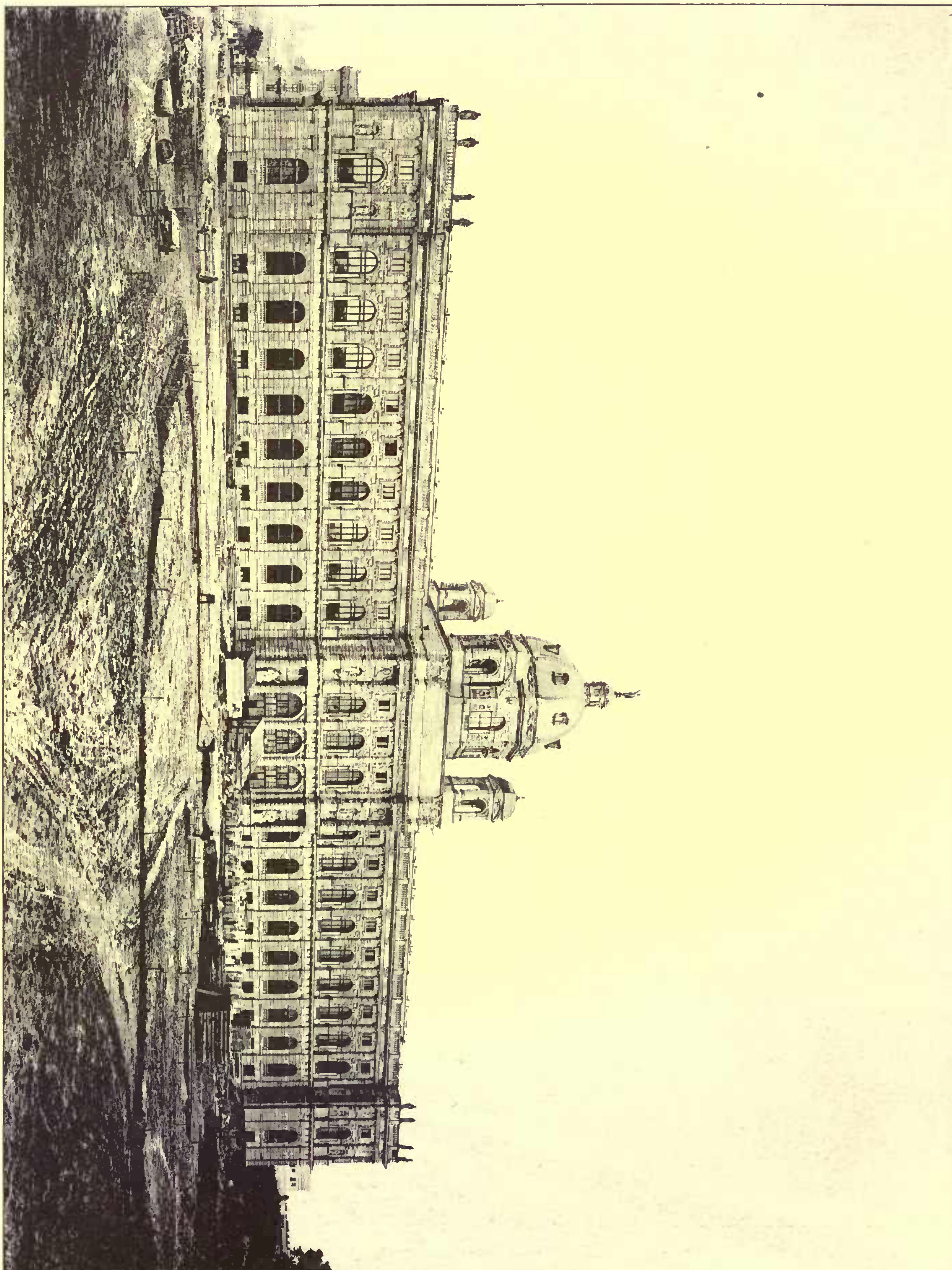


HOUSE in CHEYENNE, WY.

William A. Bates and Geo. D. Rainsford, Archts. 119 Bway. New York.

HELIOTYPE PRINTING CO. BOSTON.

No. 476 American Architect and Building News, Feb. 7 1885



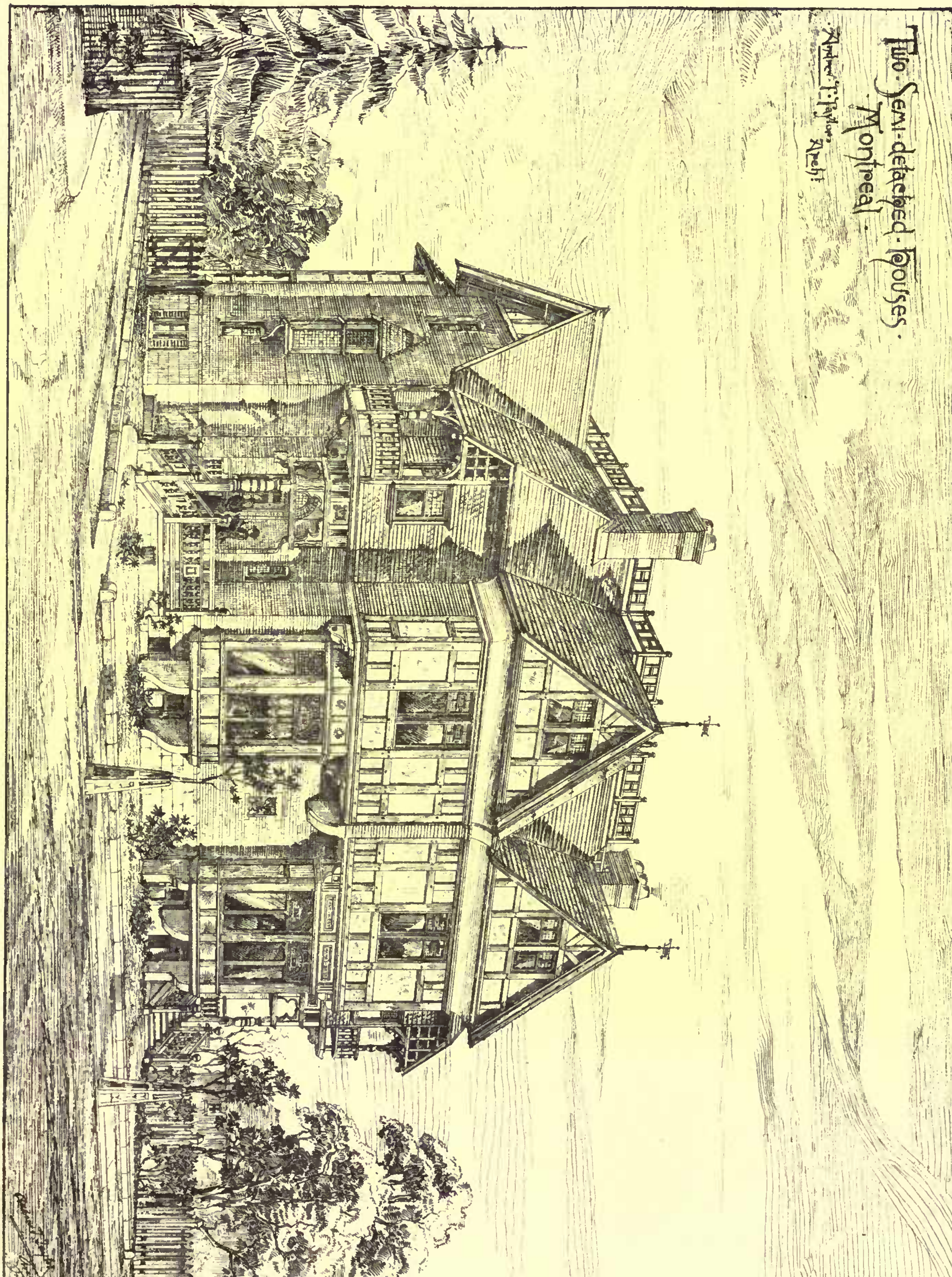
Museum of Natural History, Vienna, Austria.—1884.

PHOTO CAUSTIC, HELIOTYPE PRINTING CO. BOSTON.

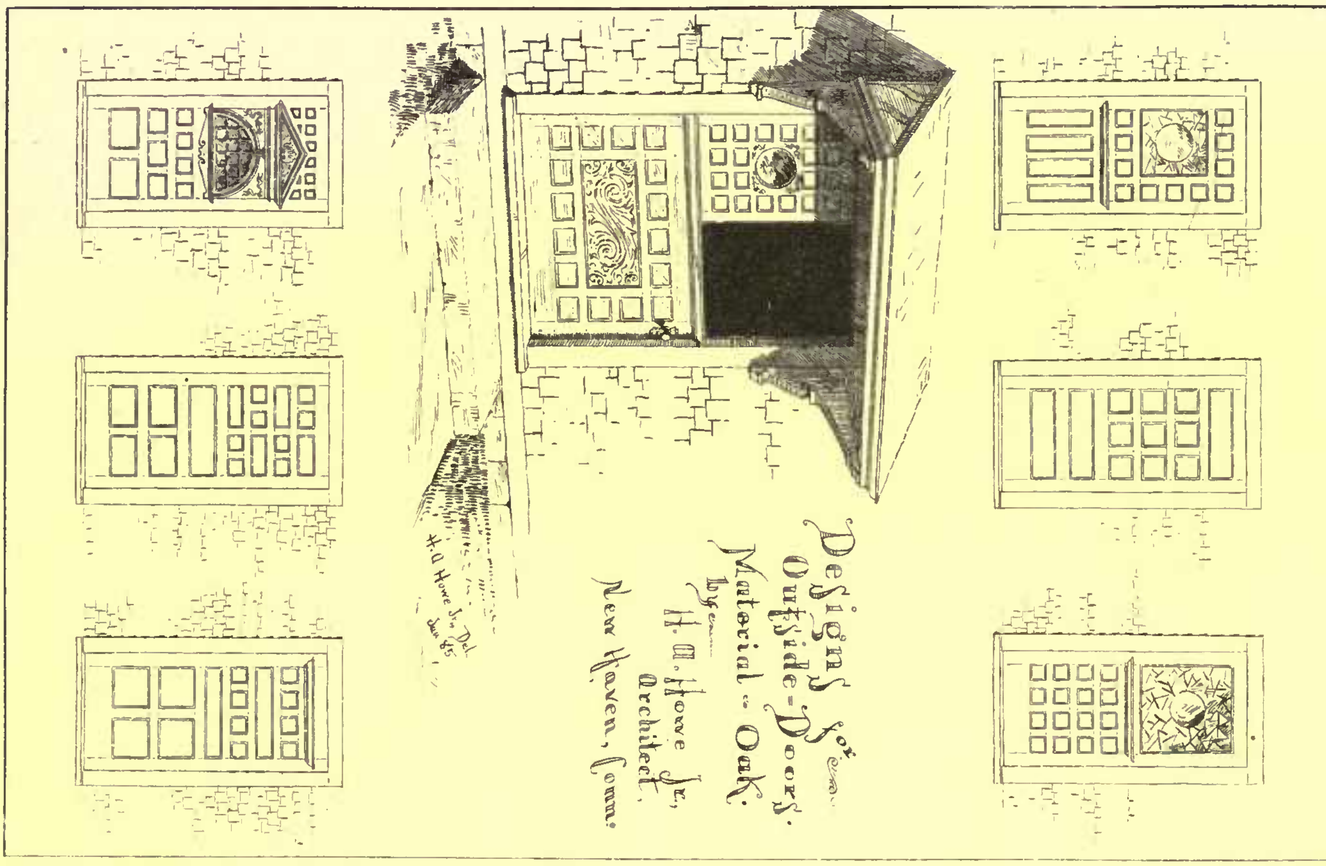


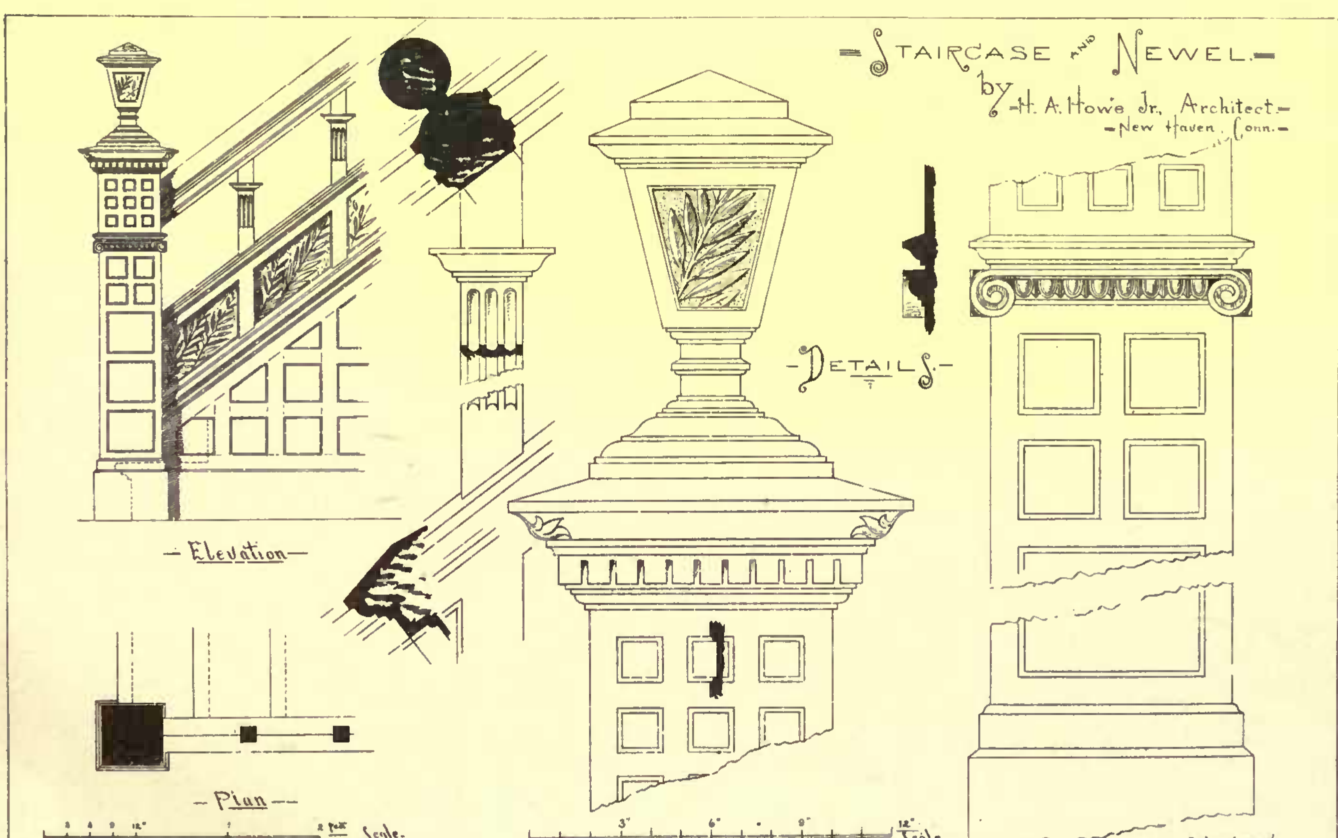
PHOTO CAUSTIC, HELIOTYPE PRINTING CO. BOSTON

La Caisse d Epargne, Sens, France.-1884



HELIOTYPE PRINTING CO. BOSTON





HELIOTYPE PRINTING CO. BOSTON

with the clank of machinery. Trade and not art is the presiding goddess here; great foundries and ship-building yards abound, and acres upon acres of docks: all the interest is centred in these. Here are ironclads being built for the French Government, there great ocean steamers for the Compagnie Transatlantique, one of the best known of the French-American mail-lines to Mexico, and the West Indies. St. Nazaire is their sailing port, and in the docks lie several of their magnificent fleets; with their red funnels and great bulk they look like veritable Cunarders, and at sea it must be difficult to tell the difference. They make any one from ship-building England open his eyes and think: all the signs of a great seaport and a great future are here, and though we are told that the best workmen in the ship-yards are English, that does not get over the fact of our red funnelled friends being here in abundance, so that he who runs had better read.

To the architect the only building of any interest in the place is the old church: it is probably of the sixteenth century or earlier in some parts; quite a seaport church with a good deal of timber in its construction. It has a great high-pitched roof tumbled about in curious fashion, and a wooden spire of the most picturesque sort. The whole group is more of a study for a painter than an architect, the roofs and walls being full of delicious gray and brown tints; its site is also most effective, and the houses cluster around it almost lovingly.

Internally the only subject of interest is a very fine reredos and altar of late seventeenth-century work; it is in colored marbles with sculptured figures, a good deal knocked perhaps, but still in good preservation, if only it were rid of the dirty lace and tawdry paper flowers with which it is bedecked, it might have a chance of going far to redeem an otherwise uninteresting interior. There are also traces of an older edifice to be seen in the round arches of the nave — or portion of the nave rather — and in the timber-work of the roof, a portion of which is evidently very much older than the rest.

St. Nazaire itself is a hot, sandy, dusty place in summer; it is in the position of a town which is growing, with partially laid-out streets and incomplete blocks of houses. Most of its people rush off at this season to cruise for sea-bathing, and we hardly wonder at it. It was with little regret, therefore, so far as St. Nazaire was concerned, that we found ourselves on board the steamer for England, and in the evening of another lovely day sailed down the few miles of the river and out over the bright waters of the Bay of Biscay towards Belle-Isle and home, but thoroughly delighted with our few days on the Loire. J. M. B.

THE ILLUSTRATIONS.

MUSEUM OF NATURAL HISTORY, VIENNA, AUSTRIA.

THIS view shows one of the twin buildings which form the last work upon which Gottfried Semper was engaged, in coöperation with von Hasenauer. The scheme of their designs included a series of triumphal arches which were to connect the museum buildings with the palace upon the other side of the street, so as to make a single composition of the several buildings.

DETROIT ROLLER-SKATING RINK, DETROIT, MICH. MR. W. E. BROWN, ARCHITECT, DETROIT, MICH.

HOUSE AT CHEYENNE, WYO. T. MESSRS. BATES & RAINSFORD, ARCHITECTS, NEW YORK, N. Y.

SEMI-DETACHED HOUSES, MONTREAL, CANADA. MR. ANDREW T. TAYLOR, ARCHITECT, MONTREAL, CANADA.

DESIGNS FOR DOORS, STAIRCASES, ETC. MR. H. A. HOWE, JR., NEW HAVEN, CONN.

LA CAISSE D'EPARGNE, SENS, FRANCE.

DECORATIVE TILES.



THE student of architectural pottery when he seeks to find the earliest examples in enamelled plastics naturally turns to Mesopotamia, and finds that the earliest positive record of a colored pavement dates back to about 521 B. C. It was at Susa, in the garden court of the Palace of Ahasuerus, who is probably the Xerxes of the Greeks, and is described as "a pavement of red and blue, and white and black marble."[1]

The art of enamelling in glazed colors was well understood by the people of this locality, at the time when the pavement was in use, as well as at an earlier period, as will appear from the description of the peculiar enamelled coffins which were used. Blue was a favorite color, and the red and blue of the pavement may have been enamelled tiles, and the white and black of marble. The colors employed by the ancient Egyptians were red, yellow, blue, sometimes green, and white and black, and these were the favorite colors employed in the architectural decorations of Nineveh and Babylon, and even after the lapse of centuries we find these same colors to-day predominantly employed.

It has been often stated that the floor of the Temple of Solomon was a colored pavement. The temple was finished nearly five hundred years earlier than the period already named, and it would be very interesting to know that the floor of this most beautiful building was so paved; but in Kings vi: 15, we are distinctly told that the floor of the temple was covered with planks of fir.

The history of colored pavements probably followed the high perfection in brick-making, which most flourished during periods of great extravagance. Diodorus of Siculus relates that the bricks of the walls of Babylon, erected under the orders of Semiramis were decorated with all kinds of living creatures portrayed in various colors upon the brick before they were burned.

An idea which was once popular, to the effect that the art of painting in enamelled colors, which afterwards became glazed or fixed to a clay body, originated about the ninth century with the Arabians in Spain, is clearly disproved by the glazed bricks of Babylon, the enamelled tiles from the ruined cities of the desert, and the colored, glazed coffins of those Assyrian cities of the dead discovered by Mr. Kennett Loftus. These enamelled coffins were in general use at Warka, Niffar, Zibizza, and other localities throughout Chaldea. In form, they resembled a slipper, but in symmetry and elegance they were models of beauty, their general design and finish displaying a high knowledge of the art of pottery. The body was placed in the coffin through an oval aperture near the head, which was afterwards sealed with a close fitting lid, cemented down with very fine lime mortar. In order to prevent the bursting of the coffin by the confined gases, a semicircular hole was left in the lower end. The top was divided into square panels by raised ridges, which were sometimes plain, and at others very ornamental; each panel or division was relieved by a similar diminutive embossed warrior, measuring about six and one-half inches. The small figure had its legs wide astride, a short sword belted on the left side, the arms akimbo, and the hands rested flat on a short fitting tunic. The head-dress was peculiar, and the general resemblance was similar to the figures on coins of the Parthian and Sassian periods. Glazing of rich green enamel covered the entire exterior surface of the coffin, and within the color was blue. The Arabs were attracted by the gold ornaments which these coffins contained, and often broke and despoiled them in large numbers.

The art of glazing in fixed colors came to us partially through the Arabians in Spain, who derived it from India, and primarily from China. It is certain that the art of enamelling in the Island of Majorca, where it reaches great perfection, was derived from the Arabians in Spain.

Glazed decorative tiles were much used in Mediæval times for paving sacred edifices; they were sometimes called Norman tiles by old writers, from the supposition that they originated in Normandy; although no tiles have as yet been discovered in England that coincide with the features of the Normon style of architectural decoration, the most ancient being apparently of the thirteenth century. The Normans were a race quick to seize upon every art that would add to the beauty of their buildings, either externally or to the interior; and after the return of the Crusaders in the twelfth century, many ornaments were added to their structures. When the Crusaders visited Byzantium, Palestine and Syria, they discovered buildings highly ornamented, and in which glazed tiles were used, and they were attracted by many of the architectural features. They carried back with them detail drawings of mouldings and designs, and among other things, glazed tiles, and most likely some knowledge of their manufacture.

The Abbey of Voulton near Provins, the hunting gallery of St. Louis at Fontainebleau, a chateau near Quimperlé, St. Etienné d'Agen, and many other buildings offer curious specimens of Norman tiles, and the employment of decorative tiles about the same period was not less common or much less brilliant in England.

Stone had supplied the wants of the Normans until the twelfth century; but from this time new ideas everywhere appeared at once; tiles of red earth of various forms were substituted for stone; their surfaces were covered with a thin layer of white clay, in which were incrusted patterns of darker earth or *vice versâ*. These baked enamelled tiles were not so easily worn by the constant steps of the faithful, as they were trodden every day in the vast naves of the churches by the feet of the Christian multitude.

The tiles were arranged in the pavements in a graceful chequerwork; trefoils, rosettes, and scrolls of notched leaves were formed and combined into graceful borders. Sections of divided circles were ornamented with stars or heraldic suns; warriors heavily armed, clad in armor, and mounted upon richly caparisoned horses,

[1] Esther i: 6.

were in active pursuit of one another; heads, busts, lions, eagles and all other things that fancy and heraldry could jointly invent, lent seeming life and animation to the cold pavements. Most of the ornamental combinations resembled the designs we are accustomed to see in the textile fabrics of the East; and we are of course the less astonished at this when we remember the visits of the Crusaders to Syria, Byzantium and Palestine, where this character of ornamentation was so largely employed from the ninth until the twelfth century.

The Normans even at that early date, believed not only in massive details of construction; but also in the cheerful effects of a harmonious combination of colors and designs for interior relief.

All the rich Norman mouldings were copied by the English, and most likely a great part of the knowledge of the employment and manufacture of glazed tiles was imparted to them by their Norman neighbors, who were a most energetic race; they took excessive delight in building; and their princes and nobles seem to have enjoyed their greatest pleasure in dwelling in and constantly beautifying their magnificent castles. But of course no credit can be claimed by the Normans for having originated glazed tiles, as this, like many other decorative arts of Western Europe was largely borrowed from the East by the Crusaders. Many of the early Norman glazed tiles correspond with features of Byzantine architecture, from which the Gothic styles are also drawn quite as freely as from the Roman.

The encaustic tiles of the Middle Ages were produced by a method wholly distinct from that now employed. The Norman tiles which have been mentioned are of this character; the process was commonly adopted and employed in northern Europe from the twelfth to the fifteenth century, after which tiles of this character fell into disuse. Parker states that the process of manufacture which, as it is supposed was commonly employed, may be described as follows: —

The thin squares of homogeneous clay having been moulded and allowed to dry gradually until of the proper firmness, a design in relief was impressed upon them, leaving the ornamental pattern in cavetto; into the hollows or depressions thus left upon the face of the tile, clay of another color was impressed: the clay usually employed for the last operation was white or pipe-clay. The tiles were fully and carefully dried, and then partly burned, after which they were finished by covering them with a thin surface of metallic glaze, which was of a slightly yellow color, and in the subsequent process of fixing this glaze in the furnace, the white clay beneath the glaze was tinged, and the red clay received a more full and rich tone of color. In order to facilitate the equal drying of the tiles as well as the burning, deep scorings or hollows were made on the reverse side, and in addition the pavement was more fully held together by the cement, the bond being stronger for it. The sizes of these tiles varied from about four to six inches square, and their ordinary thickness was about one inch. It was necessary that the shrinking nature of the clay should be about equal, and there is not the least doubt but that ingredients were used to act as a check upon the more fatty clays, or otherwise most of the designs would be full of cracks from unequal shrinking, or the surfaces would bulge and be thrown upwards. Imperfections of these characters are not wanting; but their general infrequence corrroborates the statement that ingredients were employed to equalize the shrinkage in drying and in burning. Occasionally, either from the scarcity of white clay of suitable quality in some locations, or for the sake of variety, glazed tiles of this character occur which have the design left hollow, and not filled-in according to the usual process; but a careful examination of the disposition of the ornament will frequently show that the original intention was to fill these vacant cavities as in other specimens. But instances also occur when the ornamental design was evidently intended to remain in relief, the field and not the pattern being left in cavetto.

In the British Museum there is a portion of the pavement which was discovered in the ruined priory church at Castle Acre, Norfolk, and the glazed tiles which formed this pavement are among the oldest specimens employed in England. It has been stated that glazed tiles of superior make and finish have been discovered in the priory church at West Acre, Norfolk: this priory was founded by Ralph de Tony, in the reign of William Rufus, for canons of the order of St. Augustine.

The tiles from the pavement of the church in Castle Acre are ornamented with scutcheons of arms, and on some appear the name of "Thomas." The execution of these tiles is very coarse; clay of a different color was not employed to fill the cavities, and as a whole they are very much inferior to the Norman tiles of the same period.

The term encaustic has also been applied to glazed tiles of the kind in which the coloring ingredients are mixed with the clay, and were it not already applied to denote the antique process of art which has just been described, and which is so manifestly of a perfectly different nature, the term would not be inappropriate.

The name majolica is applied to all tiles or earthenware having the ornament in relief, the embossed ornament and ground being decorated with various colored enamels.

The art of manufacturing and enamelling majolica ware was lost for a long period, but in the fifteenth century, this ware and the art of imitating ancient productions were highly prized by the Italians, under the names majolica and *porcellana*, from the Portuguese word for a cup, and Robbia ware after the sculptor who re-discovered it.

The first manufactory of this ware possessed by the Italians was erected at Faienza, in the Ecclesiastical States, whence the French term *faïence*, now much used had its derivation. The body of the ware was usually a red clay, and the glaze was opaque; the oxides of lead and tin, mixed with potash and sand, were the usual ingredients employed in producing it.

This glaze was the re-discovery of Luca della Robbia, which, after the exercise of great patience and "experiments innumerable," he was able to apply not only mechanically, but with great artistic skill. Until he was past forty-five years of age Robbia's inclinations were towards sculpture, and both his finished and unfinished work of this period most decidedly establish his claim to a very high rank among Italian sculptors. Robbia executed one of the finest of the many cinque-cento tombs for the Bishop Benozzo-Federighi of Fiesole. A portion of the decorations of this tomb were enamelled tiles painted with fruits and flowers in their natural colors. Luca also introduced some changes by coloring his enamel for certain portions of the background, such as the plants, draperies, etc. He left a large number of these works, which are exquisitely beautiful. The secret of Robbia's method of enamelling was always carefully guarded, and after his death his family made a system of polychromatic architectural decorations, and the knowledge was a great fortune to them.

Robbia's son, Luca II and nephew Andrea, decorated the Ceppo Hospital at Pistoja, with a frieze which represents the seven acts of Mercy; the work required eleven years for its execution, and the effect is very pleasing as well as brilliant. Luca II was employed by Pope Leo X to pave the Loggie of the Vatican with colored glazed tiles. Two of Robbia's other sons, Girolamo and Giovanni, also worked in Robbia ware, the first named went to France and was much employed by Francis I in the decoration of his Chateau de Madrid, in the Bois de Boulogne.

Bernard Palissy, about the middle of the sixteenth century, which was a century later than the first productions of Luca della Robbia, manufactured a similar article, but differently ornamented, which is called "Palissy ware." This ware is remarkable for its faithful imitation of animals and plants, as well as for its beautiful and gently blended glaze.

The patience with which Palissy prosecuted the discovery of this ware, his fortitude under successive failures in ovens and in burnings, his hard labor, loss of credit and consequent poverty and suffering for more than sixteen years, display energy and courage of a high order, and seem much more like a romance than a reality. The small fishes, frogs, reptiles, and grasses, which he used in ornamenting the ware, were taken from the rivers, marshes and fields, and before they had time to wither were quickly cast in some rapidly-setting composition. The mould was then carefully divided in any number of desired parts, and the animal or grass which served as a model removed, the grease with which the object was covered, making this quite easy without injury to the cast. The place of final manufacture of Palissy ware was at Saintes in France.

Not long after Palissy, the Dutch produced a ware similar in designs to the Robbia and Palissy wares; it was very substantial and well made, and they called it Delft ware; but it was utterly destitute of those beautiful and gracefully expressive forms and paintings for which the Robbia ware of Faienza is so highly esteemed, and for which it will probably be remembered until the end of civilization.

The remarkable and beautiful pavement of the Château of Ecouen has often been ascribed to Italians, and the credit of producing these beautiful tiles is sometimes attributed to a member of the della Robbia family, at other times to a fugitive from the majolica manufactures, and some French writers have even credited them to the talent of Bernard Palissy.

There is not the slightest question as to the origin of these tiles; this indication of the place of their production is inscribed among the arabesques, A. ROUEN, 1542, and the receipt of Masseot Abaquesne, enameller in earth, then living in the parish of Notre Dame de Sottevillelez, Rouen, for the final payment of this work was executed Thursday, March 7, 1548.

The reputation of Abaquesne had been made previous to the paving of the Château of Ecouen. In 1535, he decorated a "*salle faïencé*" at the hotel known as the "Logis du Roi" at Havre, and in the manor-house of Bévilliers, near Harfleur, a pavement almost similar, inscribed 1536. In 1557, Abaquesne gave a receipt in full and clear of all demands for the making of a certain number of enamelled tiles for the Sieur Durfe, as Governor of the Dauphin (later the young and short-lived Francis II), according to the designs which Durfe had given him for that purpose.

These tiles were possibly used in this "Château de la Faïencée," as Delorme styled it after being ousted from the direction of the works, and it is not at all unlikely that these same tiles found a place in the pavements of the château while under the direction of this identical Delorme in 1557.

In addition to the colored tiled pavements the interior walls of all Mediæval buildings were intended to be colored, and the color entered into and formed part of the original design, which in most cases has been lost from the practice of whitewashing them over, which so generally prevailed in the seventeenth and eighteenth centuries. Whenever this whitewash is removed carefully, the original coloring appears; but unfortunately in getting off the whitewash, the original thin coat of fine plaster which formed the *gesso* or ground to paint upon, is removed in company with it. In some instances the stone itself seems to have been painted upon, and the color mixed with wax varnish, which is impervious to moisture; and although these have been treated to repeated coats of the worse than senselessly applied whitewash, the coloring still reappears, seemingly in defiance of the ignorance which ordered its application.

STABILITY OF CHIMNEY-SHAFTS.

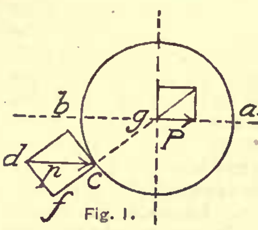


Fig. 1.

CHIMNEY-SHAFTS are exposed to the lateral pressure of the wind tending to overturn the structure. This pressure may be assumed to act horizontally, and to be of uniform intensity at all heights above the ground, without any appreciable error. The inclination of the surfaces of the chimney to the vertical is usually so small that it may be disregarded in estimating the pressure of the wind against the shaft. The greatest intensity of wind-pressure used to be taken by Rankine at 55 lbs. per square foot against a flat surface directly opposed to it. Although anemometers have registered much greater pressure than this, even as high as 80 lbs. per square foot, we have it on the authority of Messrs. Fowler and Baker that the records of anemometers, as at present obtained, are utterly misleading and valueless for all practical purposes, and a gauge was made in the presence of a Board of Trade Inspector to register 65 lbs. by the sudden application of a pressure not exceeding 20 lbs., the momentum of the index needle sufficing to cause the error. Mr. B. Baker, in his paper on the Forth Bridge, read before the British Association at Montreal, 1884, says: "Mr. Fowler and I are of opinion, therefore, as a result of our two years' further consideration, that the assumed pressure of 56 lbs. per square foot (recommended to be allowed for by the Board of Trade Committee on Wind-Pressure) is considerably in excess of anything likely to be realized."

The pressure of wind against a circular shaft may be taken as being equal to half the total pressure against a diametral section of that shaft. This result is obtained as follows: —

In Figure 1 let $d\,c = p$, the force of the wind acting parallel to the diameter $b\,a$. Resolve this force into its component parts, acting at right-angles to one another at the point c, one of them, $f\,c$, being a normal to the curve; we then have $f\,c$ as representing the force of the wind acting towards the centre of the shaft, and $f\,c = p \cos. \angle\, d\,c\,f$. Resolving this force, $f\,c$ at the point g, so as to measure the effective force exerted in the direction $g\,a$, parallel to the wind, we have the effective pressure $P = p \cos.^2 \angle\, c\,d\,f$. This angle $d\,c\,f$ ranges from 0° to 90°, and taking a sufficient number of angles we obtain $\cos.^2 \angle\, d\,c\,f =$ about .5, therefore the mean effective pressure of wind against the semi-circumference, $P = .5\,p$.

In this manner we obtain that if the pressure on a square shaft be taken = 1, that on a hexagonal shaft may be taken = .75, that on an octagonal shaft may be taken = .70, that on a circular shaft may be taken = .5.

If it is required to determine the stability of that portion of a chimney-shaft above the bed-joint $c\,d$, Figure 2,

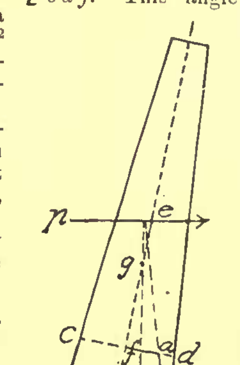


Fig. 2.

Let A = the area of the diametral section of the shaft above $c\,d$, then the pressure of the wind against the shaft will equal

$$P = p\,A \text{ for a square chimney,}$$
$$P = .5\,p\,A \text{ for a round chimney,}$$

and its resultant may be taken as acting in a horizontal line through c, the centre of gravity of the diametral section. Let H represent the height of e above $c\,d$, then the overturning moment is: —

$$P\,H = p\,A\,H \text{ for a square chimney,}$$
$$P\,H = .5\,p\,A\,H \text{ for a round chimney,}$$

and the *least* moment of stability of the shaft above $c\,d$ should be equal to this.

It is evident that this lateral pressure of the wind will tend to move the centre of pressure on the joint $c\,d$, towards the lee side. It is found in practice advisable so to limit the deviation of the centre of pressure from the centre of figure, that the maximum intensity of pressure at the leeward side shall not exceed twice the mean intensity. Let q denote the ratio which the distance of this deviation bears to the length of the joint $c\,d$, then we have the following value as given by Rankine: —

$$\text{For square chimneys } q = \tfrac{1}{3},$$
$$\text{For round chimneys } q = \tfrac{1}{4},$$

which is practically taking a factor of safety of 2 for round shafts, and $\frac{3}{2}$ for square shafts.

If we take a chimney the axis of which is not vertical, as in Figure 2, it is evident that the least moment of stability is that which resists the overturning action of the wind in the direction in which the shaft leans. Let g be the centre of gravity of the part of the shaft above $c\,d$, f a point in the joint $c\,d$, vertically below g, a the limit of deviation of the centre of pressure, j equal the length of $c\,d$, q^1 the ratio which the deviation of f from the middle of joint bears to j, W the weight of the shaft above $c\,d$; all the values being in feet and pounds; then the *least* moment of stability is

$$W \times f\,a = W\,(q - q^1)\,j,$$

which should equal the moment of wind pressure. Therefore we have the equation: —

$$PH = W\,(q - q^1)\,j.$$

Substituting the values of $P\,H$ and q, this becomes: —

$$p\,A\,H = W\,(\tfrac{1}{3} - q^1)\,j \text{ for square chimneys,}$$
$$\frac{p\,A\,H}{2} = W(\tfrac{1}{4} - q^1)\,j \text{ for round chimneys.}$$

Let T be the mean thickness of the brickwork above the joint $c\,d$, and t the thickness to which the brickwork would be reduced if spread out upon a flat area equal to the external area of the shaft. This reduced thickness is given approximately by: —

$$t = T\left(\frac{i - T}{j}\right).$$

In most cases, however, the difference between T and t may be neglected.

If w be the weight of a cubic foot of brickwork = 112 lbs. generally, we have: —

$$W = 4\,A\,t\,w \text{ for square shafts,}$$
$$W = 3.14\,A\,t\,w \text{ for round shafts,}$$

and substituting these values in the equations above given, we obtain:

$$p\,H = (\tfrac{4}{3} - 4\,q^1)\,t\,w\,j \text{ for square chimneys,}$$
$$p\,H = (1.57 - 6.28\,q^1)\,t\,w\,j \text{ for round chimneys.}$$

If we consider the chimney to stand vertically on its base, this becomes: —

$$p\,H = \tfrac{4}{3}\,t\,w\,j \text{ for square shafts,}$$
$$p\,H = 1.57\,t\,w\,j \text{ for round shafts.}$$

In the above formulæ the tenacity of the mortar has been disregarded, and it should never be taken into consideration in designing new shafts, as many months from the erection must elapse before the tenacity of the mortar is appreciable.

The foregoing formulæ enables us to determine the greatest pressure a shaft will withstand when we have the dimensions, forms, and thicknesses of the masonry or brickwork of the chimney given, and also to find the value of t for each bed-joint when we have the pressure of the wind p and the external form and dimensions of the chimney given.

A chimney-shaft consists of a series of sections one above the other, each section being of uniform thickness, and each succeeding section diminishing in thickness from that immediately below it, and it is obvious that the bed-joints dividing the sections have less stability than the intermediate ones; hence it is only necessary to apply the formulæ to the former set of joints, including the joint at the ground line.

The stability against wind of Messrs. Tennant & Co.'s chimney, St. Rollox, Glasgow, Prof. Rankine determined by the formulæ herein given. — *From Chimney Construction, by R. M. Bancroft and F. J. Bancroft*, 1885.

DEATH OF EASTBURN HASTINGS, A. A. I. A.

AMERICAN INSTITUTE OF ARCHITECTS,
SECRETARY'S OFFICE, 110 CATHERINE STREET,
NEWPORT, R. I., January 28, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — At a quarterly meeting of the Board of Trustees A. I. A., held at the Bryant Building, in the City of New York, on Wednesday, the 21st inst., the Secretary stated that he was in receipt of a letter from the family of Mr. Eastburn Hastings, an Associate of the Institute, conveying the intelligence of his decease on the 11th of September, 1884.

On motion, Mr. Henry M. Congdon was appointed a committee to prepare a minute of sympathy and respect. The following resolutions were presented by Mr. Congdon and adopted: —

Resolved,—That the Board of Trustees, having heard with regret of the death, on the 11th of September, 1884, of Mr. Eastburn Hastings, long time Associate of the American Institute of Architects, desire hereby to express to his family their sense of the loss of one of their members, and their sincere sympathy with the relatives who mourn his decease.

It was also resolved that a committee be appointed to communicate this resolution to his family; that it be spread upon the minutes of the Board of Trustees and a copy forwarded to the *American Architect* for publication. Respectfully, GEO. C. MASON, JR.,
Secretary, A. I. A.

KEENE'S CEMENT.

HULL, P. Q., January 29, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,—I notice in your paper, the *American Architect*, which I get through Durie & Son, Ottawa, the advertisement of Keene's Cement, coarse and superfine. Please, if you possess the knowledge, give me an analysis of it, with the difference between the coarse and superfine. In case you cannot supply the required information, please let me know who can, or if there is any book or work treating upon the same, and greatly oblige,

Yours very respectfully, C. B. WRIGHT.

[KEENE'S cement is of great service in furnishing the interior of fire-proof buildings, as can be seen at the Museum of Fine Arts, Boston, the Morse Building in New York, and many others. The coarse is perhaps the most serviceable for upper works, as it is white and capable of receiving a

hard polish, while the superfine, as it is harder when set, is most suitable for skirtings, door finish, etc., and as both kinds are commonly painted, its inequality of color is not a material disadvantage. Both grades are prepared from plaster-of-Paris, as follows: In a saturated solution of alum, made by dissolving in a gallon of water one pound of alum, are soaked eighty-four pounds of calcined plaster-of-Paris, introduced in small lumps; after being exposed to the air for eight days, the plaster is recalcined at a dull-red heat and then ground. A half-pound of copperas added to the cement gives it a cream color, and is said to increase its power of resisting atmospheric influences.—Eds. American Architect.]

FIRE-PROOF BUILDING.

Boston, Mass., January 26, 1885.

To the Editors of the American Architect: —

Dear Sirs, — "E. A." in a recent number inquires for plans of fire-proof schools and churches. It is easier to make plans for such than to get the public to pay for the extra cost of fire-proof building at the outset. It is considered cheaper to frame the walls with studs 2″ x 4″, 12″ apart, and form a series of flues, good vents for fire, all round, than to use heavier studs at wide intervals, with the space filled in with slabs of cement-concrete, as done by Lascelles & Co., of London. Plastering exteriors of frame buildings would be a step nearer fire-proof construction. R. B., Jr.

WHERE TO RUN A SOIL-PIPE.

Newark, N. J., January 14, 1885.

To the Editors of the American Architect: —

Dear Sirs, — Will you kindly inform me if it is better to place a three-inch iron soil-pipe between the plaster and boards of a frame building or on the inside of plaster, where it will be exposed to view?

Yours truly, A. Connelly.

[Inside, if it can be arranged so as not to cause too great disfiguration of the rooms. If it must go between the studs, it should be so arranged as to be accessible for its full height from the inside. — Eds. American Architect.]

A HISTORY OF ROMAN ARCHITECTURE.

Denver, Col.

To the Editors of the American Architect: —

Dear Sirs,—You will greatly oblige by informing me, through your paper, which are the best books on the "History of Roman Architecture," from its earliest stage. Very faithfully,

Roman.

[We confess to being seriously puzzled as to what is the proper answer to give to this apparently simple question. If "Roman" reads French, he may find Batissier's "*Histoire de l'Art Monumental*" as much to his purpose as anything which can be found within a single cover. — Eds. American Architect.]

GLUE-WATER IN MIXING STUCCO.

Fort Dodge, Iowa, January 26, 1885.

To the Editors of the American Architect: —

Dear Sirs,—What knowledge have you of the use of glue and sand in the mixing of mortar made of stucco and plaster (gypsum) for rough or first coat work?

In this country for a number of years we have used for rough or first-coat work in plastering a mortar made of the above materials in the following proportions: one-third stucco, two-thirds sand, mixed with a solution of glue in water, to retard the setting of the mortar (about four quarts of glue-water to the one hundred pounds stucco) and we desire to ascertain how long these materials have been used in connection with stucco for making mortar.

How long has glue-water been in use as a retarder in connection with stucco? How long have sand, ground coke or cinders been used in mixing mortar with stucco?

Give us all the information you have in connection with these materials for mortar, and send your bill to us.

Very respectfully, S. S. Marsh.

[We have never heard of the use of glue for the purpose our correspondent describes, and can find no mention of it in the books, but think it not unlikely that it may be more or less familiar to stucco-workers. At any rate we should think it might have suggested itself, through accidental observation, to some one of the many who habitually use glue moulds in their work. If it is a novelty, there will probably be many who will welcome and profit by the hint now given. We imagine that the other materials used in mixing mortar with stucco date from time immemorial. If any of our readers possess more definite information, they have here an opportunity to air it and "send in their bill." — Eds. American Architect.]

NOTES AND CLIPPINGS.

The Ailantus. — Many complaints have been made of the overpowering and offensive odor of the flowers of the ailantus trees planted in the streets of Paris and other large cities. According to M. E. André, it is only the flowers of the male trees which exhale this unpleasant scent, and he recommends that none but female trees should be for the future planted in public or other places where the peculiar odor of the males might be offensive. This would seem an important point for Americans and others who plant the Ailantus largely as a street tree. — *Woods and Forests.*

The New Commissioner of Labor Statistics. — The President has nominated Col. Carrol D. Wright, of Massachusetts, to be Commissioner of Labor Statistics.

An Architect's Suit. — The action of James K. Wilson, architect, against D. Webster Lane and George Boshart was tried lately before Judge Koon and a jury. Mr. Wilson alleged that in the summer of 1884 he performed work for the defendants in drafting the preliminary sketches and drawing the plans and specifications for a building proposed to be erected at the corner of Nicollet avenue and Ninth street. This labor was worth the sum of $840. This sum is unpaid as yet, and action is brought for the full amount. The defendants, answering, allege that the work was not worth $840; that before it was commenced at all they positively stated to the plaintiff that they did not wish to do anything about the building unless it could be erected for $20,000, and they did not wish him to begin the plans or do anything, in fact, unless he would take the chance of losing his work in case the building could not be put up for that sum. The contract was definite on this point. Mr. Wilson then went to work and completed his plans, but by his own confession a building could not be put up according to them short of $35,000. They were therefore abandoned. The testimony adduced in the trial of the action seemed to establish this fact. The jury returned a verdict for defendants. — *St. Paul Pioneer Press.*

The Pullman Sewage-Farm. — The Pullman sewage-farm, and the results attained upon it, have received wide attention. As is pretty generally known, the Pullman farm is probably the most extensive example of the purification of sewage by the downward intermittent filtration system now in operation. The farm is situated three miles south of the city of Pullman, the sewage of which it receives, and to which it is conveyed through a large iron pipe. The farm has been in operation three years. In 1883, the produce was as follows: cabbage, 120,000 heads; potatoes, 7,958 bushels; onions, 1,000 bushels; squash, ten tons; turnips, 100 bushels; celery, 8,200 dozen bunches. In 1884 the yield has been: cabbage, 200,000 heads; potatoes, 6,400 bushels; onions, 3,500 bushels; squash, forty-five tons; turnips, 500 bushels; celery, 18,000 dozen bunches. This shows a decided increase in everything except potatoes, due largely to the increased skill acquired in the management of the farm and the application of the sewage. Full cars of produce have been shipped to various large cities, such as Vicksburg, Pittsburg, New Orleans, Atlanta, and Memphis. Orders have been shipped as far east as Hartford, and south as far as Galveston. There has recently been established on the farm a sauerkraut manufactory, and it is probable that a large quantity of this favorite composition will be manufactured. There is a dairy supplied by Holstein cattle on the farm. The undrained land, some of which was sown to oats, yielded twenty-two bushels to the acre in 1884. One hundred tons of hay were cut. About forty farm hands were employed this year. The superintendent of the farm sells the produce himself, no middlemen being allowed to manipulate it. The crop of 1883 paid 8 per cent on the investment; the crop of 1884 was larger, but the prices prevailing were somewhat lower. There is no question about the success of this farm, and its history is a valuable one for the numerous cities now considering the question of how to get rid of sewage. — *The Sanitary News.*

Cements for Special Purposes. — The value of a cement is, first, that it should become a strongly cohering medium between the substances joined; and, second, that it should withstand the action of heat, or any solvent action of water or acids. Cement often fails in regard to the last consideration. For waterproof uses several mixtures are recommended, and the following may be mentioned: one is to mix white lead, red lead, and boiled oil, together with good size, to the consistency of putty; another is powdered resin, one ounce, dissolved in ten ounces of strong ammonia; gelatine, five parts, solution of acid chromate of lime, one part. Exposing the article to sunlight is useful for some purposes. A waterproof paste cement is said to be made by adding to hot starch paste half its weight of turpentine and a small piece of alum. As a cement lining for cisterns, powdered brick two, quicklime two, wood-ashes two, made into a paste, with boiled oil, is recommended. The following are cements for steam and water joints: ground litharge, ten pounds; plaster-of-Paris, four pounds; yellow ochre, one-half pound; red lead, two pounds; hemp, cut into one-half inch lengths, one-half ounce, mixed with boiled linseed oil to the consistency of putty. White lead, ten parts; black oxide of manganese, three; litharge, one; mix with boiled linseed oil. A cement for joints to resist great heat is made thus: asbestos powder, made into a thick paste, with liquid silicate of soda. For coating acid troughs, a mixture of one part pitch, one part resin, and one part plaster-of-Paris is melted, and is said to be a good cement coating. Correspondents frequently ask for a good cement for fixing iron bars into stone in lieu of lead, and nothing better is known than a compound of equal parts of sulphur and pitch. A good cement for stoves and ranges is made of fire-clay with a solution of silicate of soda. A glue to resist damp can be prepared with boiled linseed oil and ordinary glue; or by melting one pound of glue in two quarts of skimmed milk; shellac, four ounces; borax, one ounce, boiled in a little water, and concentrated by heat to a paste. A cement to resist white heat may be usefully mentioned here: pulverized clay, four parts; plumbago, two; iron-filings, free from oxide, two; peroxide of manganese, one; borax, one-half, sea-salt, one-half; mix with water to thick paste, use immediately, and heat gradually to a nearly white heat. Many of the cements used which are exposed to great heat fail from the expansion of one or more ingredients in them, and an unequal stress is produced; or the two substances united have unequal rates of expansibility or contractility; the chemical or galvanic action is important. The whole subject of cements has not received the attention it deserves from practical men. Only Portland cement has received anything like scientific notice, and a few experiments upon water-proof, heat-resisting and other cements would show which cements are the best to use under certain circumstances.—*Building News.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

311,165. SKELETON TOWER. — John S. Adams, Elgin, Ill.

311,166. ELECTRIC-LIGHT TOWER.—John S. Adams, Elgin, Ill.

311,167. IRON GRATING. — John S. Adams, Elgin, Ill.

311,178. EXPANSION-JOINT FOR STEAM AND OTHER PIPES. — T. W. Duffy, New York, N. Y.

311,192. AUTOMATICALLY DISINFECTING WATER-CLOSETS, URINALS, ETC. — Wm. J. Longley, Mount Vernon, N. Y.

311,202. WRENCH. — Washington L. Parker, Spartanburg, S. C.

311,204. FIRE-EXTINGUISHER.—John S. Sbrawder, Upper Dublin, Pa.

311,205. WATER-COCK ATTACHMENT. — Lawrence Shuster, Jr., Philadelphia, Pa.

311,207. WATER-CLOSET TANK OR CISTERN. — Michael J. Smith, New York, N. Y.

311,221. LEVELLING-ROD. — Henry F. Bean, Jackson, Mich.

311,239. COMBINED FIRE-ESCAPE LADDER AND VENTILATING-FLUE. — James W. Evans, New York, N. Y.

311,241. SAW-VISE.—Henry Flater, Findlay, O.

311,245. SKYLIGHT. — Eduard Henn, Jersey City, N. J.

311,248. CALIPERS. — Stewart A. Jellett, Philadelphia, Pa.

311,252. WINDOW.—Martin S. Millard, Kansas City, Mo.

311,253. DUMB-WAITER. — Stephen A. Morse, Philadelphia, Pa.

311,256. TRANSOM-LIFTER. — August F. Pfeifer, Newark, N. J.

311,271. DISINFECTING APPARATUS. — Russell Thayer, Philadelphia, Pa.

311,279. SAFETY-ATTACHMENT FOR ELEVATORS.—Arthur M. Baker, New York, N. Y.

311,288. SASH-FASTENER. — William Brown, Duncannon, Pa.

311,307. DOOR-SPRING. — William Gilfillan, New Haven, Conn.

311,309. DEVICE FOR RENDERING WOODEN HOUSES FIRE-PROOF.—John N. Glover, Chicago, Ill.

311,313. HOT-AIR HEATING APPARATUS.—John L. Hamilton, St. Joseph, Mo.

311,327. HYDRAULIC LIFT. — William H. Johnson, Westminster, County of Middlesex, Eng.

311,342. HOPPER WATER-CLOSET.—Henry W. Mansur, Boston, Mass.

311,366. SASH-FASTENER. — Benj. L. Rex, Lovettsville, Va.

311,369. ELEVATOR.—Samuel T. Richardson, Baltimore, Md.

311,386. SURVEYING-INSTRUMENT. —Chas. E. Taft, Chicago, Ill.

311,392. WEATHER-STRIP. — Gustavus G. Wagner, Mount Vernon, N. Y.

311,394. COMBINED ANVIL, VISE AND DRILL. — Jas. Weathers, Indianapolis, Ind.

311,401. PAINT.—William H. Wilber, Buffalo, N. Y.

311,442. LUMBER-DRIER.—Horace J. Morton, Pullman, Ill.

311,443. PORTABLE WATER-CLOSET. — Charles C. Nash, Providence, R. I.

311,448. SHUTTER-FASTENER. — John S. Ryan and John Conway, New York, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

GUANO WORKS.—The Zell Guano Company are building entire new works, consisting of mill-building, acid-chambers, elevator, storage-shed, etc., to cost about $100,000, from designs by W. Claude Frederic, architect; P. A. Hause, superintendent; F. H. Smith, consulting engineer.

DWELLINGS.—W. Claude Frederic, architect, has prepared plans for Jacob Sanm, builder, for 8 three-st'y and basement brownstone buildings (bay-window fronts), to be erected on s s North Ave., near Eutaw Pl., on lot 100' x 140', to cost about $32,000.

ADDITION. — St. Paul's Eng. Lutheran Church are to build a brick addition to Sunday-school building, to cost $2,500, from designs by W. Claude Frederic, architect.

BUILDING PERMITS. — Since our last report ten permits have been granted, the more important of which are the following: —

J. D. Mason, two-st'y brick warehouse, 131 McElderry's Wharf.

Isaac Eigengneer, 2 two-st'y brick buildings, e s Dallas St., e of Gough St.

Ch. Schultze, three-st'y brick building, s s Shakespeare St., between Bond St. and Broadway.

W. L. Stork, 22 three-st'y brick buildings, s s North Ave., between Bolton and Park Sts.

Thos. H. Hanson, 3 five-st'y warehouses, commencing n e cor. Lombard and Liberty Sts.

Lawrence Turnbull, 13 three-st'y brick buildings, n s Preston St., between Greenmount Ave. and Proctor Alley; 1 three-st'y and 15 two-st'y brick buildings, e s Greenmount Ave., between Hoffman and Preston Sts., and 21 two-st'y brick buildings on the e s, and 20 two-st'y brick buildings on the w s Wirt St., between Greenmount Ave. and Procter Alley.

The Labor Quotations remain unchanged.

Brooklyn.

BUILDING PERMITS. — *Bainbridge St.*, n s, 158' w Reid Ave., two-st'y brick dwell., tin roof, wooden cornice; cost, $4,000; owner, Kate Acor, 187 Bainbridge St.; architect, Clarence Liniken; builders, Lewis Acor and C. Linikin.

Palmetto St., No. 80, s s, 350' e Bushwick Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner and builder, David H. Scott, 762 Monroe St.; architect, Ernest Dennis.

Franklin Ave., e s, 75' n Park Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,500; owner, August C. Hodderson, cor. Franklin and Park Aves.; architect, Mr. Harverson; builders, Mr. Collins and Williams Bros.

Bergen St., n s, 268' e Clason Ave., three-st'y brick tenement, tin, gravel and felt roof; cost, $4,000; owner, etc., T. W. Swimm, 394 Gates Ave.

Sumner Ave., s w cor. McDonough St., four-st'y brick flat, tin roof; cost, $11,000; owner, W. A. Cuyck, 171 Stuyvesant Ave.; architect, Th. Engelhardt; builders, G. Lehman & Sons and M. Metzen.

Broadway, No. 791, e s, 25' n Adams St., four-st'y brick store and tenement, tin roof; cost, $8,000; owner, J. M. Otto, 453 Grand St.; architect, Th. Engelhardt; builders, J. Rauch and J. Rueger.

Lynch St., n s, 122' e Harrison Ave., three-st'y frame tenement, tin roof; cost, $4,000; owner and architect, Jno. Platte, 244 Lynch St.

Fourteenth St., n s, 197' 10" w Seventh Ave., 6 two-st'y brick dwells., tin roof, wooden cornice; cost, each, $3,800; owners, J. E. Skidmore —— Conhead; architect and carpenter, J. E. Skidmore; masons, Buchanan & Riley.

Meeker Ave., n w cor. Kingsland Ave., three st'y brick store and tenement, tin roof; cost, $9,200; owner, Peter Ruger, 275 East Houston St., New York; architect, Leonard F. Graether; builder, John Fallon.

Adams St., No. 11, n s, 100' e Broadway, four-st'y frame (brick-filled) tenement, tin roof; cost, $6,000; owner, William Goeller, Flushing Ave.; architect, Th. Engelhardt; builders, Ernst Loerch and John Rueger.

Stagg St., Nos. 275 *and* 277, n s, 225' w Waterbury St., 2 three-st'y frame tenements, tin roofs; cost, each, $4,000; owner, Mrs. Chas. R. Baker, 244 Washington Ave.; architect, Th. Engelhardt; builders, John Auer and Peter Kunzweiler.

Tompkins Ave., w s, 25' s Quincy St., 4 four-st'y brick stores and flats, tin roofs; cost, each, $9,500; owner and builder, Jas. W. Stewart, 373 Quincy St.; architect, M. Walsh.

Tompkins Ave., s w cor. Quincy St., four-st'y brick store and flat, tin roof; cost, $12,500; owner and builder, Jas. W. Stewart, 373 Quincy St.; architect, M. Walsh.

Quincy St., s s, 80' w Tompkins Ave., two-and-a-half-st'y dwell., tin roof; cost, $5,500; owner and builder, Jas. W. Stewart, 373 Quincy St.; architect, M. Walsh.

Devoe St., n e cor. Leonard St., four-st'y frame factory, tin roof; cost, $7,500; owner, John C. Andresen, 302 Ewen St.; builder, C. Vincent.

Eighteenth St., n s, 320' w Fifth Ave., 2 two-st'y brown-stone dwells., tin roofs; cost, each, $4,500; owners, M. A. Schneider and Daniel Ryan, 152 Nineteenth St. and 725 Third Ave.; architect, T. F. Houghton.

Broadway, Nos. 689 *and* 691, e s, 55' n Ellery St., 2 four-st'y brick tenements, tin roofs; cost, $18,000; owner, Louis Stutz, 693 and 695 Broadway; architect, Th. Engelhardt; builder, John Aur and Jos. Wagner, Jr.

Cedar St., Nos. 50 *and* 52*a*, s s, 137' 9" e Evergreen Ave., 3 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $3,090; owners, C. & G. Spoerl, 44 Myrtle Ave.; architect, Th. Engelhardt.

ALTERATIONS.—*Grove St.*, n s, 183' 4" e Central Ave., raise 8 feet; cost, $3,500; owner and carpenter, P. M. Flood, on premises; architect, J. T. Miller; mason, H. O'Brien.

Chicago.

BUILDING PERMITS—M. H. McKillip, livery-stable, 199 and 201 Erie St.; cost, $3,000.

S. W. Rawson, 6 cottages, Taylor St.; cost, $6,000.

S. W. Rawson, 6 cottages, Filmore and Harvard Sts.; cost, $6,000.

J. Halloren, two-st'y dwell., 3229 Lasalle St.; cost, $3,500.

A. Deluce, two-st'y flats, 3334 South Wood St.; cost, $3,500.

L. M. Giles, two-st'y dwell., 60 Oak St.; cost, $3,500.

Woodstone & Swanson, three-st'y dwell., 146 Centre St.; cost, $3,000.

S. Piggot, 3 two-st'y dwells., 200-204 Fremont St.; cost, $9,000; architect, S. Piggot.

F. D. Reynolds, two-st'y dwell., 53 Thirty-second St.; cost, $2,500.

New York.

FLATS. — At Nos. 228 and 230 East Forty-second St., a five-st'y flat, 50' x 90', is to be built at a cost of about $48,000, for Messrs. Gordon Bros.; from designs of Mr. A. Wagner.

On the s s of Eighty-fifth St. between Madison and Fourth Aves., a six-st'y apartment-house, 41' x 92', is to be built by Mr. P. Braender, with front of brick, stone and terra-cotta; from designs of Mr. John Brandt; and from designs of the same architect 8 five-st'y brown-stone flats, 25' x 85' each, are to be built by Mr. George Muller on the s e cor. of Eighty-fourth St. and Second Ave., at a cost of about $140,000.

At Nos. 68, 70 and 72 Norfolk St., 3 five-st'y brick and stone tenements, 25' x 85' each, are to be built for Mr. S. J. Silberman, at a cost of $60,000; from plans of Mr. W. Graul.

FACTORY. — On the s s of Forty-first St., e of Tenth Ave., a seven-st'y iron front building 75' x 75', is to be erected for Mr. P. Pyrihll, at a cost of about $50,000; from designs of Mr. Albert Wagner.

BUILDING PERMITS. — *Fifty-fifth St.*, n w corner Eleventh Ave., five-st'y brick tenement and store, tin roof; cost, $18,000; owner, James Brooks, 373 West Fifty-sixth St.; architect, John F. Wilson.

Eleventh Ave., w s, 25' 5" n Fifty-fifth St., five-st'y brick tenement and store, tin roof; cost, $14,000; owner and architect, same as last.

Twenty-second St., n s, 117' 4" w Ave. A, five-st'y brick warehouse and factory, gravel roof; cost, $25,000; owner, Carl H. Schultz, 76 University St.; architect, Ed. E. Raht.

Seventy-second St., n s, 51' 2" e First Ave., five-st'y brick tenement, tin roof; cost, $15,000; owners, Ph. and Wm. Ebling, St. Anns Ave. and One Hundred and Fifty-sixth St.; architects, Pfund & Son.

Seventy-second St., n s, 76' 6" e First Ave., 2 five-st'y brown-stone front tenements, tin roofs; cost, each, $12,000; owner and architect, same as last.

Bleecker St., No. 95, six-st'y brick warehouse, tin roof; cost, $50,000; owner, Joseph Andrade, London, Eng.; architects, Alfred Zucker & Co.

East Forty-third St., No. 203, five-st'y brick tenement and store, tin roof; cost, $15,000; owners, Hartley and Wm. Haigh, 139 East Forty-third St.; architects, D. & J. Jardine; builder, Wm. Haigh.

Ninety-second St., n s, 130' w Fourth Ave., three-st'y brown-stone front dwell., tin roof; cost, $15,000; owner, Jacob Wicks, Sr., 508 East Eighty-seventh St.; architect, John Brandt.

One Hundred and Forty-sixth St., n s, 400' e Tenth Ave., two-st'y brick dwell., tin roof; cost, $7,000; owner, Clifford Barbee, 207 West Fourteenth St., architect, Henry Fouehaux.

Franklin St., No. 184, six-st'y brick tenement, tin roof; cost, $12,000; owner, Louis Meyers, on premises; architect, Louis Meystre.

West Forty-eighth St., No. 402½, five-st'y brick tenement, tin roof; cost, $5,000; owner, Simon Kay, 353 West Forty-eighth St.; architect, M. C. Merritt.

Delancey St., s s, 25' w Sheriff St., 2 five-st'y brick tenements, tin roofs; cost, each, $12,000; owner, Mark Riualdo, 220 East Thirty-third St.; architects, A. B. Ogden & Son.

Norfolk St., Nos. 116 *and* 118, 2 five-st'y brick tenements, tin roofs; cost, each, $14,000; owner, Jacob Raichle, 227 William St.; architect, Julius Boekell.

Ninth Ave., n w cor. Ninety-fourth St., and s w cor. Ninety-fifth St., 2 four-st'y brick tenements and stores, tin roofs; cost, each, $14,000; owner, John M. Pinkney, 716 Madison Ave.; architect, J. H. Valentine.

Ninth Ave., w s, 22' n Ninety-fourth St., 8 four-st'y tenements and store, tin roofs; cost, each, $13,000; owner and architect, same as last.

East One Hundred and Fifty-second St., No. 628, three-st'y brick and frame tenement, tin roof; cost, $5,000; owner and builder, Matthens Meusch, on premises; architect, Chas. W. Miller.

Houston St., s e cor. Crosby St., seven-st'y brick warehouse and factory, tin roof; cost, $85,000; owners, G. Sidenberg & Co., 49 Mercer St.; architects, Alfred Zucker & Co., 346 Broadway.

ALTERATIONS.—*One Hundred and Twenty-ninth St.*, n w cor. Tenth Ave., four-st'y brick extension to Grammar School, tin and slate roof; cost, $85,000; owner, City of New York, S. A. Walker, President Board of Education, 8 East Thirtieth St.; architect, D. J. Stagg, 146 Grand St.; builder, Joseph Spears.

Third Ave., e s, 200' n One Hundred and Sixty-ninth St., four-st'y extension (on front) to Grammar School No. 61, tin and slate roof; cost, $85,000; owner and architect, same as last; builder, Thos. Overington.

Thomas St., Nos. 11 *and* 13, *and* 82 *and* 84 Worth St., three-st'y brick extension, iron and glass roof; cost, $4,000; owner, New York Real Estate Association, G. P. Slade, treasurer, 110 Leonard St.; architect, Richard Berger; builder, Wm. Slade.

Third Ave., No. 1515, three-st'y brick extension, tin roof; cost, $5,000; owner, Louis Braecht, 1493 Third Ave.; architect, John Brandt.

West Fifty-third St., No. 45, repair damage by fire; cost, $5,000; owner, estate John S. Giles, 174 Canal St.; builders, James Hamel & Son.

Broadway, Nos. 177 *and* 179, take out part of centre wall on each floor to connect building, rearrange rooms, new stairs, elevator; cost, $20,000; owner, Geomania Fire Insurance Co., 175 Broadway; architect, Ferdinand Fish; builders, L. N. Crow and Hamilton & Henry.

Broadway, No. 697, five-st'y brick extension (on lots 693 and 695 Broadway), tin roof; cost, $30,000; owners and architects, Maclay & Davies, 120 and 697 Broadway; builders, Wm. Haigh and James H. Banta.

Philadelphia.

Germantown Ave., No. 3046, three-st'y store, 14' x 50'; Gottlieb Bienzinger, contractor.

Sumac St., e of Ridge Ave., two-st'y store and dwell., 18' x 60'; A. A. Harmer, owner.

St. Louis.

BUILDING PERMITS. — Fourteen permits have been issued since our last report four of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

C. F. Buermann, two-st'y double dwell.; cost, $2,500; W. W. Love, contractor.

C. F. Buermann, 3 adjacent two-st'y dwells.; cost, $3,000; W. W. Love, contractor.

Monk, three-st'y stores and tenements; cost, $3,000; G. I. Barnett, architects; sub-let.

Jno. B. Link, two-st'y dwell.; cost, $3,000; J. H. Frye, contractor.

E. Beggemon, double two-st'y brick dwell.; cost, $4,000; C. Sinnentkohl & Co., contractors.

Mrs. D. Poertner, 2 adjacent two-st'y dwells.; cost, $3,500; C. H. Poertner, contractor.

General Notes.

CHARLESTON, S. C. — The following permits were issued during the month of January, 1885, for the erection of new buildings and the improvement of old buildings in the city: —

New buildings, 40 permits; reported cost, $34,075.

Old buildings improved, 9 permits; reported cost, $4,050.

Total permits for January, 1885, 49; total cost, $38,125.

The report for the same period of 1884 was 43 permits, and the reported cost, $27,275.

Mr. W. F. Carter has a contract to build 7 houses for Mr. S. J. L. Matthews, 2 at the cor. of Tradd and Friend Sts., and 5 on the cor. of Tradd and Limehouse Sts.

Eau Claire, Wis. — Architect Radcliff of St. Paul has been selected by Rev. Father Collins, of St. Patrick's Church, to execute the plans for the new church to be erected the coming season.

Ellendale, Dak. — A public meeting has been held at Ellendale, and a bonus of $25,000 in promises and land offered for the location of the peripatetic capital at that place.

Hastings, Minn. — Arrangements have been made and contracts signed for the buildings of a large pork packing establishment on the river front at Hastings. It will be ready for use next fall.

Newport, R. I. — The City of Newport, R. I., have accepted plans for fire engine-house and ward room, to be located in Third Ward; S. S. Ward, architect, Boston.

Red Wing, Minn. — Among the many residences to be built the coming summer is a costly one by Hon. William Eisenbrand.

Rochester, N. Y. — Plans are being prepared for a malt-house for the Genesee Brewery, to be built cor. of Race and Cataract Sts, its cost, $25,000; O. Knebel, architect.

The recent jail competition-work of preparing plans, has been awarded to Warner & Brockett architects; building to cost, $67,000.

PROPOSALS.

COURT-HOUSE. [At Clarinda, Io.]

Clarinda, Io., January 9, 1885.

Sealed Proposals for building a court-house at Clarinda, Page County, Io., will be received at my office **until 12 o'clock, noon, Wednesday, February 18th, 1885.** Plans and specifications will be on file at the court-house in Clarinda, on and after February 1, and may be seen prior to that time at the office of Foster & Liebbe, Architects, Des Moines Io.

The right is reserved to reject any or all bids.

By order of the Board of Supervisors.

477 R. H. LYMER, Auditor.

IRON-WORK. [At Great Kanawha River, W. Va.]

U. S. Engineer Office, 378 St. Paul St.,
Baltimore, Md., January 24, 1885.

Proposals for the iron-work of the pass of a movable dam on the Great Kanawha River, West Virginia, four miles below Charleston, embracing about 130,000 pounds of wrought, and 97,000 pounds of cast-iron, will be received at the U. S. Engineer Office, Charleston, Kanawha County, West Virginia, **until noon of February 14, 1885,** and opened immediately thereafter.

Specifications can be had upon application to Mr. A. M. Scott, Assistant Engineer at Charleston. Drawings will be exhibited and all necessary information given at the Charleston office.

WM. P. CRAIGHILL,
477 Lt.-Col. of Eng'rs, U. S. Army.

COURT-HOUSE. [At Farmington, Me.]

January 26, 1885.

Sealed proposals will be received at the Clerk of Courts Office, Farmington, Me., **until 12 o'clock, M., Tuesday, February 17, 1885,** for furnishing the materials and erecting a court-house for Franklin County, at Farmington, Me.

Plans and specifications may be examined and all information obtained at the Clerk's office in Farmington and at the office of G. M. Coombs, architect, Lewiston, Me.

Proposals will be received for the whole or a part of the work and materials.

The right is reserved to reject any or all bids.

F. W. PATTERSON,
ISAIAH CHICK, } County Commissioners.
477 S. K. WELLMAN,

COURT-HOUSE ALTERATIONS. [At Preston, Minn.]

Preston, January 9, 1885.

The County Commissioners of the County of Fillmore, in the State of Minnesota, will receive sealed proposals **until the 25th day of March, 1885, at 12 o'clock, M.,** at the office of the county auditor, in the village of Preston, said county, for the remodeling of the county court-house in said village, and the building of 2 two-st'y brick additions thereto, and iron vaults therein, and the furnishing all materials, in accordance with the plans and specifications therefor on file in the office of said auditor, which can also be seen at the office of Mayberry & Son, architects, Winona, Minnesota.

No bids will be received except for the whole building complete as specified.

The successful bidder will be required to give a sufficient bond with sureties, within a reasonable time to be fixed by said commissioners, in the sum of $15,000, to be approved by said commissioners, conditioned upon the faithful performance of his contract.

Each bid must be accompanied by a sufficient bond with sureties, or a duly certified check payable to said county in a sum of at least five per cent of such bid, conditioned upon the giving the bond above specified within the time so fixed, provided such bid should be accepted. The work will cost several thousand dollars, and must be completed on or before the first day of November, 1885. Right reserved to reject any or all bids.

J. G. MINER,
Chairman Board of County Commissioners.

Attest: G. A. Hayes, County Auditor.

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PROPOSALS.

JAIL. [At Scranton, Pa.]

Office of the Commissioners of Lackawanna County,
Scranton, Pa., January 24, 1885.

Sealed proposals for the erection and completion of a county jail for Lackawanna County, to be located on the corner of Washington Ave. and New York St., in the city of Scranton, Pa., will be received by the undersigned Commissioners of said county, at their office **until Thursday, February 26, 1885, at 10 o'clock in the forenoon.** Plans and specifications will be on file at the court-house in the city of Scranton, on and after Tuesday, January 27, 1885. The builder to whom the contract shall be awarded will be required to enter into bonds with at least two approved sureties for the sum of $20,000, for the faithful performance of the contract. Work to be commenced within thirty days after the awarding of the contract, and to be finished on or before April 1, 1887.

The Commissioners reserve the right to reject any or all bids.

WM. FRANZ,
H. L. HALSTEAD,
WM. J. BURKE,
County Commissioners.

Attest: D. W. Powell, Clerk. 478

SCHOOL-HOUSE. [At Morgan, O.]

Sealed proposals will be received by the Board of Education of Morgan Township, Butler County, O., for the building of a brick school-house in Sub-District No. 4, of said Township, **until 12 o'clock, noon, of the 12th day of February, 1885.**

Said board reserves the right to reject any or all bids.

Plans and specifications can be seen at the Township Clerk's Office in Okeana. 476

IRON WATER-PIPE. [At Providence, R. I.]

Board of Public Works,
Office, City-Hall,
Providence, R. I., January 27, 1885.

Sealed proposals will be received at this office **until 11 o'clock, A.M., Tuesday, February 10, 1885,** for furnishing the following sizes of cast-iron water-pipes.

Five hundred tons of 2240 pounds, six inches in diameter.

Three hundred tons of 2240 pounds, eight inches in diameter.

To be delivered on wharf in this city.

The delivery to commence on or before May 1, and to be completed on or before August 1, 1885.

A bond satisfactory to the Board in the sum of eight hundred dollars, as liquidated damages, for failure to execute the contract within ten days, if awarded, will be required of each bidder, and a satisfactory bond in the sum of five thousand dollars conditioned upon the faithful fulfilment of the contract, will be required of the successful bidder.

Specifications and forms of contract and of proposals may be obtained on application at this office.

The Board reserve the right to reject any or all bids.

CHAS. E. CARPENTER,
CLINTON D. SELLEW,
476 Board of Public Works.

CAST-IRON WATER-PIPES. [At Boston, Mass.]

City of Boston, City Hall,
Boston Water Board Office, Jan. 29, 1885.

Sealed proposals will be received at this office **until 12 o'clock, M., of Thursday, the 12th day of February, 1885,** to be endorsed "Proposals for Cast-Iron Water-Pipes for the Cochituate Department," and at that time and place they will be publicly opened and read.

Bidders are required to state in their proposals their names and places of residence.

Each bid must be signed by the bidder and accompanied by a written bond of a responsible person, giving his place of business or residence, and conditioned for the execution of the contract (with satisfactory security for its performance) within the time specified in this advertisement in case the bid be accepted, or in lieu of the bond aforesaid, a sum of money or other satisfactory collateral security in the same amount may be deposited with said Water Board.

The amount of the bond required with the bid is $500.

The person to whom the contract may be awarded will be required to execute the contract within four days (not including Sunday) from the date of notification of such award and the preparation and readiness for signature of the contract.

The delivery of the pipes on each contract to commence on or before April 15, 1885, and to be completed on the 15th day of August, 1885.

The estimate of quantities required and by which the bids will be compared is as follows: —

20 tons 4-inch pipe, class B.
520 tons 6-inch pipe, class B.
425 tons 8-inch pipe, class B.
165 tons 12-inch pipe, class A.
700 tons 12-inch pipe, class B.
120 tons 16-inch pipe, class A.
70 tons special castings.

Specifications may be obtained and plans seen at the office of the City Engineer, City Hall, Boston.

The amount of security required will be such sum as may be fixed by the Water Board after the proposals are opened; said sum not to be less than one-fourth nor more than one-half of the amount of the contract.

The sureties of the bond for the contract must be residents of Massachusetts.

The Water Board reserves the right to reject any or all proposals, should it deem it to be for the interests of the city of Boston so to do. 476

PROPOSALS.

STONE AND BRICK WORK, ETC. [At Erie, Pa.]

Office of Supervising Architect,
Treasury Department,
Washington, D. C., January 27, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 28th day of February, 1885,** for furnishing and setting all the stone and brick work for the superstructure of the court-house, post-office, etc., at Erie, Pa., in accordance with specifications and drawings, copies of which may be seen and any additional information obtained at this office or the office of the local superintendent of the building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
476 Supervising Architect.

CARPENTRY. [At Cincinnati, O.]

Office Trustees to Rebuild Court-House,
Hamilton County, Ohio,
Cincinnati, January 21, 1885.

South Court-House Yard.

Sealed proposals will be received at this office **until 9 1-2 o'clock, A. M., on Saturday, February 7, 1885,** for furnishing the carpenter and joiner work in rebuilding the court-house in Hamilton County, O., according to plans and specifications on file at this office and at the office of James W. McLaughlin, architect, Nos. 46 and 47 Johnston Building. The bids must be made on the blanks that will be furnished on demand by said Board.

The Board reserves the right to reject any and all bids. By order of the Board.

479 J. CLIFFORD GOULD, Clerk.

STONE AND BRICK WORK. [At Lynchburgh, Va.]

Office of Supervising Architect,
Treasury Department,
Washington, D. C., January 27, 1885.

2 P. M., on the 26th day of February, 1885, for furnishing the labor and material, bricks, terra-cotta, stone, mortar, etc., and building complete the masonry of the walls of basement and superstructure of the court-house, post-office, etc., building at Lynchburgh, Va., in accordance with drawings and specifications, copies of which may be seen and any additional information obtained on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
476 Supervising Architect.

ROLLED-IRON BEAMS AND PLATE GIRDERS. [At Washington, D. C.]

Office of Building for State, War and Navy Departments,
Washington, D. C., January 22, 1885.

Separate sealed proposals for furnishing and delivering the rolled-iron beams and sixteen plate girders required for four floors of the west and centre wings of the Building for the State, War and Navy Departments in this city will be received at this office **until 12 M., on February 17, 1885,** and opened immediately thereafter, in presence of bidders.

Specifications, general instructions to bidders, and blank forms of proposal, for either the beams or the girders, will be furnished to established manufacturers on application to this office.

THOS. LINCOLN CASEY,
476 Colonel, Corps of Engineers.

LABOR AND MATERIALS. [At Harrisonburg, Va.]

Office of Supervising Architect,
Treasury Department,
Washington, D. C., January 10, 1885.

Sealed proposals will be received at this office **until 2 o'clock, P. M., on the 24th day of February, 1885,** for furnishing all the labor and materials, including stone, bricks, woodwork, etc., required for the construction of the court-house, etc., building at Harrisonburg, Va., in accordance with drawings and specifications, copies of which, and any additional information may be obtained on application at this office or the office of the superintendent, on and after January 23, 1885.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
476 Supervising Architect.

COURT-HOUSE. [At Troy, O.]

Auditor's Office,
Troy, Miami Co., O., January 3, 1885.

Sealed proposals will be received at this office **until 12 o'clock, noon, of February 11, 1885,** for furnishing all the material and performing the labor necessary to erect a new court-house at Troy, in said County, according to plans and specifications on file at this office.

Bids must be made according to law, and must be accompanied by a bond (to be approved by the Board of Commissioners) for at least twenty-five per cent of the amount of the bid; the bond to be conditioned that if work is awarded, a proper bond and contract will be entered into.

The Commissioners reserve the right to reject any or all bids.

Blanks for bids and bonds can be had at this office, or at the office of J. W. Yost, architect, at Columbus, O.

Bids must be endorsed "Bid for Court-House," and addressed to HORATIO PEARSON,
476 County Auditor, Troy, O.

UNITED STATES PATENT OFFICE.

C. LEO STAUB, OF PITTSBURG, PENNSYLVANIA.

CONSTRUCTION OF BUILDINGS, SHIPS, &c.

SPECIFICATION forming part of Letters Patent No. 277,952, dated May 22, 1883.
Application filed May 3, 1882. (No model.)

To all whom it may concern:

Be it known that I, C. LEO STAUB, a citizen of Switzerland, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Fire and Water Proof Structures; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 on Sheet 1 indicates a section of a fire and water proof floor and ceiling having separators fitted between the joists to divide the long air-space into compartments. Fig. 2 on Sheet 1 indicates a plan of the joists, separators, and compartments of the floor shown in Fig. 1. Fig. 3 indicates a vertical section through a hollow partition, and Fig. 4 on Sheet 1 indicates a horizontal section of the same with separators. Fig. 5 on Sheet 1 indicates a section through a strong fire and water proof floor, with open but protected joists or beams. Fig. 6 indicates a section through another fire and water proof floor, and Fig. 7 represents the plan of the top of the same. Fig. 8 indicates a sectional view of flooring, and illustrates a mode of fastening the same through the sheet metal to the sheathing or lower boards.

In Sheet 2, Fig. 1″ indicates a cross-section of a double fire-wall door, shutter, and elevator-hatchway door. Fig. 2″ indicates a section of a light-paneled partition. Fig. 3″ indicates an elevation of the same. Figs. 4″ and 5″ indicate, respectively, a vertical and a horizontal section of an incased rolled-iron beam for supporting the floor. Fig. 6″ indicates a horizontal section through a protected cast-iron column. Fig. 7″ indicates the section of a corner for a safe vault constructed of wood and sheet metal. Fig. 8″ indicates a detail drawing of a construction of the same.

Like letters of reference indicate like parts wherever they occur.

The object of my invention is to produce fire and water proof structures—such as buildings, ships, steamboats, freight-cars, furniture, and safe-vaults, &c—in a cheap, durable, economical, and efficient manner; and this object I have fully obtained by applying sheet metal entirely inclosed or incased with wood, and made as air-tight as possible, to such constructions, in the manner hereinafter set forth.

Heretofore, so far as I am aware, sheet metal has not been used in such a manner as to bring it up to the high standard it deserves as a protector against elementary influences. Generally it has been exposed directly to the action of fire, water, and air. Consequently, being a good conductor of heat, it offers little or no protection against fire when used as a covering for doors, shutters, &c., for experience has demonstrated that heavy wooden doors will keep the fire off for a longer time, on account of the non-conducting and slow-burning properties of such material, than it can be kept off by the use of ordinary iron-covered wooden doors, and when account is had of the facts that the metal in such cases is exposed directly to the decomposing influences of the air, water, and violence and to the general damage done by violence, sheet metal must be considered as the shortest-living building material.

In regular fire-proof buildings composed of incombustible materials, the iron beams and girders, which are inclosed and vaulted in between with brick, terra-cotta, hollow tiles, concrete, &c., are subject to great expansion when exposed to a fierce heat, and thus cause a movement of the walls and the ultimate collapse of the fire-proof floor-arches. In order to overcome this and the defects previously referred to, I propose, in the use of my invention, to protect or entirely inclose the sheet metal with wood—that is, on both surfaces, and on the end with wood as air-tight as possible—so that it may serve for a long time through its splendid capacities—viz., first, as an air-tight material by taking off from the fire its greatest power—that is, the draft; second, as a water-tight material to save buildings and stored goods from damage from water, which is often greater than that caused by fire; third, to utilize its resistible strength and durability to fortify and stiffen constructions; fourth, to utilize its properties as a casing for girders, beams, columns, stone-work, &c., which are liable to great expansion from the influence of heat, and to rupture or disintegration from water during conflagrations.

In the drawings, Fig. 1 indicates a water-proof floor and fire-proof ceiling.

B indicates the flooring-boards, which are planed on all sides and are nailed to the joists

J while laid diagonally. L indicates rectangular plates of sheet-lead, which are laid in between the sheathing and flooring-boards, like flags—that is, their edges are not lapped over, but border each other—and these sheets L are soldered together at the joints to form a continuous level surface. The object of this arrangement is as follows: Lead will not corrode by the action of water; second, the sheets may be readily soldered together, so that the water may be entirely prevented from passing downward and injuring the ceiling; third, as the lead sheets do not lap each other their surface is level, allowing the boards to be readily and tightly screwed together, preventing air-spaces between them, and the lead is noiseless when persons are walking or goods are moved over the floor; and, finally, as the flooring rests upon a smooth level surface of sheet-lead it is prevented from springing or yielding during the movement of persons or goods over it. Consequently its fastenings are not loosened, and greater durability is obtained.

In the construction of the ceiling, plates S, of hard metal—as sheet-iron, steel, copper, &c.—are laid in a similar manner, and are fastened to the boards B with nails or screws, the joints being filled up to a level with iron or other hard and binding putty.

F indicates the boards which form the upper portion of the floor and the lower portion of the ceiling. These boards F are laid rectangular to the joists and are planed on all sides, but are not tongued and grooved in the usual way, but in the manner shown in Fig. 8, the tongue having a little more than the double length at its top, in order to allow the nails to be driven perpendicularly through the sheet metal, and not slant, as in the usual manner, as otherwise the nails are apt to bend on the surface of the sheets and prevent an air-tight joint between the boards and the metallic sheets. In securing these boards F screws are always preferred, as it is easier to secure a very tight joint with the plates.

It is evident that the application of my improved form of floors and ceilings to old or new buildings would afford considerable protection against damage by the action of fire and water; but the long air-spaces between the joists and the studding of the usual hollow partition form a terribly dangerous row of flues, and to this cause is due the rapid and unexpected spread of fires, so destructive not only to property, but also to human life. Therefore I break up these flues by dividing these long air-spaces into short compartments A by means of separators D, which are each formed of two pieces of board planed on all sides and inclosing a hard sheet-metal plate, S, of the same size between. To fix the position of the separators correctly, small pieces of wood, *a*, are nailed to the joists, and the separators D are nailed aslant to the joists against them, as is indicated clearly by the plan view of the joists shown by Fig. 2. The top and bottom of the joists, as well as the joints formed with the separators, should be planed smoothly to get rid of dangerous air-spaces, for it must be understood that usually the joints formed between rough-sawed timbers leave from one to three sixteenths of an inch, which is sufficient to admit the headway of the flames. The hollow partition shown in Figs. 3 and 4 is constructed upon the same principle. In the plan view, Fig. 4, T indicates the studding, which are to be planed on both sides against the boarding and on the joints formed with the separators D. These separators render the floors far stronger and stiffer than the usual way of cross-bridging, and the compartments A retard, break up, and deaden sound, thus taking up the place of the usual deafening materials, which often cause moisture and decay of the wood-work. The air-spaces between the carriages or supporting-joists of wooden stairways should also be divided into similar compartments and have the under side ceiled up, as shown in Fig. 1.

In Fig. 5 a fire-proof and water-proof floor, forming a ceiling and roof, also is shown. This is made of three layers of boards with two intermediate layers of sheet metal—viz., lead sheet L on top, for the hereinbefore-described purpose of affording a noiseless and inelastic casing, and steel, iron, copper, &c., sheet S below, laid exactly as before described. The heavy timbers J, forming the joists or beams, are protected air-tight with the hard-metal sheets S and the boards B; but this should only be done with thoroughly dry and seasoned timber, as otherwise it would cause decay or dry-rot. This inclosing with hard sheet metal and wooden boards should be applied as a protection to all wooden posts, columns, and heavy or combination beams and girders, and in particular where they are constantly exposed to moisture. The construction shown in Fig. 5 can also be used as a deck for steam boats and ships when the joists J are curved at the top, or are replaced by curved iron beams protected as shown by Fig. 4″ on Sheet 2.

In Fig. 6, which shows another form of fire and water proof floor, ceiling, and roof, the tongued and grooved boards F are laid diagonally and nailed or screwed to the rafters, joists, or beams. S indicates the hard sheet-metal layer, as before. P are wooden boards, from ten to eighteen inches wide, planed on all sides, with rabbeted ends and sides to receive, first, a lead plate, L, to make the floor water-proof by covering the joints of the wide boards P, and to then receive a hard-wood strip, H, of a trapezoidal form, so that a tight joint may be had when the latter is screwed down to the lower boards. Fig. 7 shows the top of this floor and the cross-grained joints *b* of the boards P, covered in the same way, so that an ornamental as well as a water and air tight surface and joint is secured.

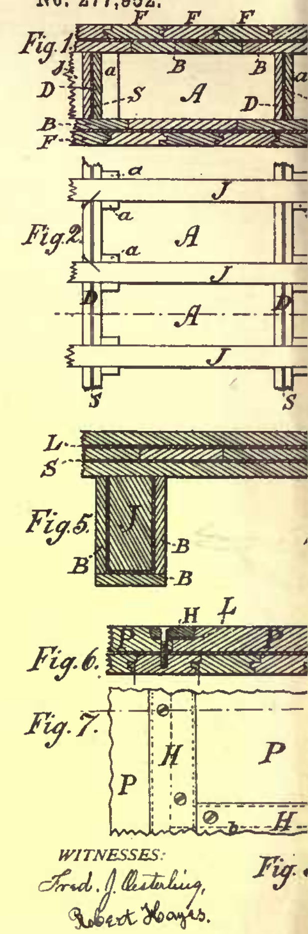
Where the end or edges of the floors and partitions do not run against wood-work they should be provided with a grooved wooden frame, C, as shown in Fig. 1″, Sheet 2, so that

(No Model.)

C. L.

CONSTRUCTION OF

No. 277,952.

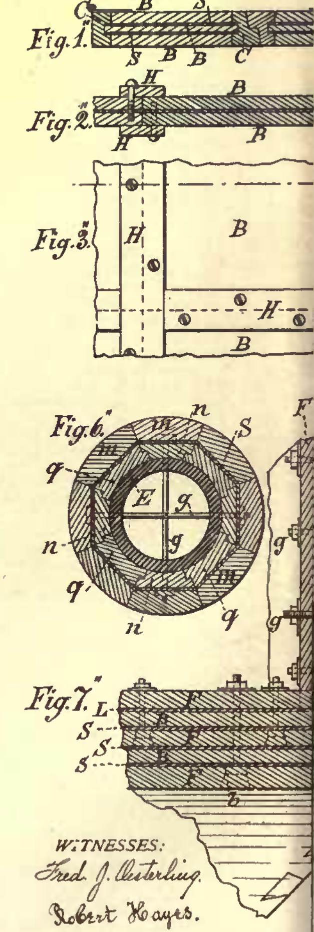


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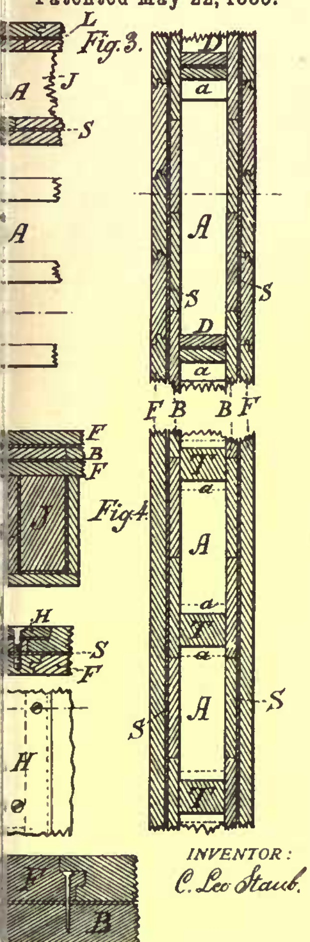


3 Sheets—Sheet 1.

AUB.

ILDINGS, SHIPS, &c.

Patented May 22, 1883.



INVENTOR:

C. Leo Staub.

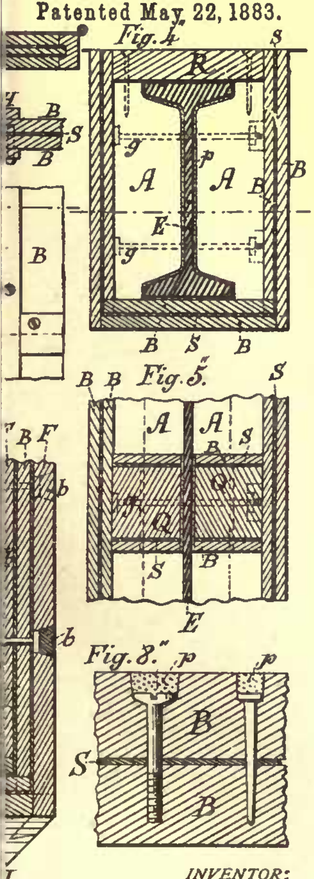
ATTORNEY

3 Sheets—Sheet 2.

AUB.

ILDINGS, SHIPS, &c.

Patented May 22, 1883.



INVENTOR:

C. Leo Staub.

ATTORNEY

the sheet metal may be entirely inclosed in wood.

As it is important that particular care should be taken in the construction of doors, fire-walls, outside and inside shutters in warehouses, &c., and to close the elevators, shafts, and hatchways at each floor, I form a double door, as shown in Fig. 1", Sheet 2, of three thicknesses of wood, B, and two intermediate plates, S, of hard sheet metal, the edges being protected on all sides by a grooved piece of hard wood, C, screwed and glued to the boards B, and the latter are joined together by screws or nails, as represented by Fig. 8", same sheet, their heads being concealed and covered with putty p. This kind of fastening should be applied to each and all constructions, except in cases where other kinds are specifically mentioned.

When thin portions of wood are used to form the cabins, berths, and bulk-heads for passengers and crews of iron steamships and steamboats, as is usually the case, they become exceedingly dangerous, forming a row of tinder-boxes to feed the fire. Hence they and the doors and shutters used in said rooms should be built as shown in Figs. 2" and 3". (Shown on Sheet 2.)

Freight-cars and their partitions may be built in the same way, and may be provided with floors, as represented in Figs. 1 and 6 on Sheet 1, this mode forming thin and safe partitions when put upright, the outer boards being set perpendicular, and the inner boards horizontal. The roof of the car may be formed substantially in the same way, and the usual roofing may be fastened to it to protect the wood-work.

Iron constructions in general—as cast-iron columns, piers, rolled and wrought iron beams, girders, trusses, &c.—should be entirely protected with wood, or they and the structure which they support cannot be regarded as safe. For this reason I propose to protect beams as shown in Figs. 4" and 5" of Sheet 2, in which Q indicates pieces of wood placed on all sides and fastened to the beams E by means of the bolts g. As the iron beams have too rough a surface to allow the formation of air-tight joints, the spaces should be filled up with the putty p. A strong top board, R, should be spiked or screwed down onto the pieces Q to receive the flooring.

In cases of conflagrations, cast-iron piers and columns supporting whole store-houses, &c., become very hot, and when cold water is thrown upon them they are bound to burst, on account of the sudden and unequal reduction of their temperature and the consequent unequal shrinkage, thus causing the entire destruction of the building and its contents. Hence I protect them as shown in Fig. 6" on Sheet 2. The cast-iron column E is incased first by the boards q and n, which are placed and rabbeted. While the boards n are grasping the boards q with their rabbet, the bolts g running through the cast-iron renders the whole thing solid and air-tight. The sheet metal S is then placed in position, and the outer boards are then secured, as shown by Fig. 8, care being had, however, that the sheet metal is first screwed or nailed into position as air-tight as possible. The side walls, piers, &c., are subject to explosion during a fire, if they are built of granite, and, if built of lime and other stones that cannot stand the fire, should be effectually protected through this improvement.

In Fig. 7" a section of a corner of a safe-vault for buildings is shown, the vault being built with hard wood and inclosed sheet metal, S S S indicating the outer layers of metal, sheet or plate steel being used in this instance, and L indicating the inner layer of sheet-lead. Said inner sheets of lead, L, are used for the purpose of rendering possible the movement of articles within the vault without noise or springing of the sheets. The hard-wood tongued and grooved boards are laid rectangular alternately, and are bound at the corners by dovetailing d. In order to hold the wood and metal layers air-tight together, small and large bolts g are applied in such a manner that if the outer layers were to become destroyed by fire the inner portion would still form a water and fire proof vault, being secured by the smaller bolts. The outside hard wooden boards, F, will be fastened as is shown in Fig. 8". All the bolts should grasp the steel plates directly with their heads, and the latter are to be protected by hard-wood pieces b, glued or puttied to the boards F. The doors of such vaults should be constructed in the same way; but all the rabbeted edges must be covered with hard wood to entirely cover the sheet metal on all sides, and to prevent the fire from attacking the steel and lead plates directly at their edges.

I am aware that it has been proposed to form a fire-proof floor by means of layers of boards and intermediate layers of sheet-iron lapped at the edges; but such a construction could not answer the purpose of my improvement on account of the following reasons: First, as the edges are lapped, the flooring would rest on the double thickness at the joints, and would give elsewhere when persons or goods moved over its surface, and this springing would soon loosen the fastenings and allow the upper boards to get out of place; second, the flooring would be liable to spring and open up at the ends of the boards, thus allowing water used for cleaning, &c., to sink down onto the metal, so that it would become destroyed in a very short time; third, the springing motion would cause the sheet-iron to give a noisy, disagreeable sound when persons or goods moved over the floor; fourth, the lapped edges are neither air nor water tight; and, finally, this construction leaves air-spaces between the sheet metal and the sheathing and flooring, which is a great defect, as

the sheets will buckle at the ends and allow free access of air between them in case of a fire; but,

Having described my invention, what I do claim, and desire to secure by Letters Patent, is—

1. In the construction of fire-proof structures, a fire-proof ceiling, panel, casing, or partition composed of two or more layers of boards enveloping an intermediate layer or layers of sheet metal, said sheets of metal being laid with their edges bordering or adjacent to each other, and joined and arranged substantially as specified, whereby close-fitting joints are secured between the layers, and air-spaces are avoided, substantially as and for the purpose set forth.

2. In the construction of fire and water proof structures, a water-proof floor, roof, or casing composed of layers of boards inclosing an intermediate metallic layer composed of sheets of lead laid with their edges bordering or adjacent to each other, and then soldered together to form a water-tight surface, substantially as and for the purpose specified.

3. In a fire-proof structure, the combination of a fire-proof ceiling composed of layers of boards enveloping an intermediate layer of sheets of iron or other hard metal, arranged with their edges bordering or adjacent to each other, and a water-proof floor composed of layers of boards enveloping an intermediate layer of sheets of lead having their edges soldered together, constructed and arranged substantially as and for the purpose specified.

4. In the construction of fire-proof structures, the combination of a fire-proof ceiling and water-proof floor, constructed and arranged as specified, with a series of separators which are each composed of pieces of wood enveloping a sheet of hard metal, and are arranged between the joists to divide their long air-spaces into short compartments, substantially as and for the purpose herein set forth.

5. In the construction of fire-proof buildings, the combination, with the floor and ceiling, of a series of separators which are each composed of layers of wood enveloping a sheet or plate of hard metal, and are arranged between the joists to divide their long air-spaces into short compartments, substantially as and for the purpose specified.

6. In the construction of fire-proof buildings, a fire and water proof floor, ceiling, or roof composed of an upper and a lower layer of boards inclosing an intermediate layer of sheet-iron or other hard metal, the upper layer of boards having rabbeted sides and ends, which receive a strip of sheet-lead, L, and a hard-wood strip, H, constructed and arranged substantially as and for the purpose specified.

C. LEO STAUB.

Witnesses:

John S. Kennedy,

Frank M. Reese.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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FEBRUARY 14, 1885.

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CONTENTS.

ONE of the most important events which has occurred in the building world within a week is the resignation of Mr. William P. Esterbrook of his office as Inspector of Buildings for the City of New York, which he has administered for something like five years with a faithfulness and courage that have made him a conspicuous figure before the public all over the country. Happily, we are not called upon yet to write an obituary notice of him, and need not enter into the particulars of that useful life which is yet to be completed, we hope, by many years of such service to his fellow-citizens as he knows how to give; but the occasion affords us an opportunity, which we are not sorry to take advantage of, for speaking of the office which Mr. Esterbrook's resignation has just left vacant in an impersonal way, and with more freedom than would be proper under other circumstances. Although all our readers know something of the regulations under which buildings are constructed in New York, few, except architects practising in that city, understand fully the vexatious restrictions often imposed by the present laws, which, although in the main well-considered and useful, were framed with special reference to a certain class of structures, and are singularly inelastic in their application to buildings of a different character. As a consequence of this, it is not too much to say that millions of dollars have been worse than thrown away in New York within the last ten years, with the full knowledge of the owner, architect, and building inspector, in piling up brick and mortar in places where they were not needed, and where they occupied, to no purpose, ground which had been paid for at a rate exceeding the cost even of the useless masonry piled upon it. Of course, this is not the fault of the inspector, who has simply to enforce the law as it stands, whether he approves its provisions or not, but it brings upon him an immense amount of direct and indirect pressure, under the mistaken idea that he can in some way exercise a discretion which the law expressly takes away from him. An inspector can, even under such circumstances, quietly shut his eyes to the violation of the law in particular cases; but it ought not to be necessary to say that this is the wrong way of exercising official clemency, and that the only method fair to all parties is to enforce strictly the provisions of the statute until they shall have been changed by legislative enactment. To this, the only true ideal of official integrity, Mr. Esterbrook's administration was consistently faithful. Understanding, quite as well as any one, the inconveniences of the existing laws, he labored longer and more earnestly than any one else to have them modified for the better, and it has been mainly owing to the jealousies and interested machinations of contractors and real-estate owners that the very provisions which the inspector urged for the purpose of relieving them from a useless burden have been repeatedly defeated. Wherever any discretion was allowed the inspector, it has been exercised, so far as we know, with uniform consideration for the best interest of all parties. Where the safety of the public was concerned, his decisions, although seldom, if ever, unreasonable, were enforced with a vigor for which the citizens of New York will long have reason to be thankful; but many architects can testify that in respect to other matters the practical wisdom and intelligence with which their plans were criticised was constantly accompanied with a courtesy in pointing out defects or oversights, and in suggesting the best and most economical way of making improvements, which won for him the respect and regard of those most capable of appreciating such qualities.

THE *Builder* gives an account of the prize scheme submitted for heating and ventilating the new German Parliament House at Berlin, which is interesting in many ways. The scheme proposed is very carefully studied, and is worthy, so far as we can judge from the brief description, to be associated with the admirable architecture of the building. Although the building is not a very large one, as such structures go, the characteristic German thoroughness with which the theoretical principles of perfect ventilation are applied may be inferred from the fact that each of the four inlet conduits which supply fresh air to the building is thirteen feet wide by seven feet high; while the two aspiration shafts which carry off foul air have together a sectional area of two hundred and fifteen square feet. Of course, the requisite quantity of air could be forced in and out through smaller channels, but only at a higher velocity, and with the production of objectionable currents, but these dimensions are intended to permit the velocity of the air in the conduits to be reduced to a maximum of two metres, or about six and one-half feet per second. This is only about four miles an hour, so that the unpleasant draughts from the registers, which give so much annoyance in many buildings otherwise well ventilated, will be entirely obviated. For warming the air hot water is used, in connection with a partial steam service. The building is for this purpose divided into four sections, and each of these again into two parts, each of which has its own independent boiler and system of pipes. In each section one boiler and pipe-system heats the offices, lavatories, libraries or reading-rooms and dwelling-rooms which may be included in that section, leaving the committee-rooms, ante-rooms and legislative-chambers to be warmed by separate boilers and pipes, which may be thrown out of service without interfering with the use of the rooms permanently occupied. The two sets of boilers and pipes in each section are, however, connected by valves, so that either boiler will warm the water in all the pipes of the section, if any accident should happen to the other.

THE air to be warmed is taken partly from the street front, and partly, by a curious fancy, from the basin of the fountain in the neighboring square. The fountain sends up a considerable stream of water and spray, and the movement of this, together with the cooling of the air by the evaporation of watery particles, has the effect of bringing down about the fountain a current of air from a considerable elevation, washed free of dust by the spray, and nearly saturated with moisture, which is easily abstracted for use in the building by means of openings around the walls of the basin. On reaching the building the air receives a preliminary warming by a coil of pipes in the inlet-channel, and is then filtered through porous cloths woven for the purpose, and further moistened by spray and evaporating surfaces. It then passes into a series of collecting chambers, one of which is situated under each room to be heated. Corresponding to each warm-air collecting-chamber is a cool-air chamber, separated from it by a narrow passage-way, called the mixing passage, and simple sliding doors admit air in various proportions from each chamber to the mixing passage, from which it is delivered into the room above. In warm weather ice-water is to be made to circulate through the hot-water coils, in the expectation that the air will be cooled by it to an agreeable temperature. The removal of foul air is effected through passages corresponding with the fresh-air conduits, and leading to two immense shafts at the end of the building. The current in these is to be maintained by coils of steam-pipe through which either live or exhaust steam from the main engine can be carried, assisted by fans. The cost of the apparatus is estimated at one hundred and eighteen thousand dollars, and this is probably a low price for it.

SOME of the questions which vex our builders and architects are very much like those that trouble their French fellows, and it is interesting to find that at least one of the superstitions current among contractors in this country prevails also on the other side of the ocean. A correspondent of *La Semaine des Constructeurs* recently asked advice on three points. In regard to the first, he explained that a contractor was directed by the written order of the architect of an important building to use iron tie-rods and anchors of a certain size. On reflection the contractor came to the conclusion that anchors of the specified size would not be strong enough, and he expressed this opinion in writing to the architect, notifying him that he would not be responsible for the consequences of using such inadequate materials. The architect replied, also in writing, that the ties were strong enough, and that he refused to accept the letter of the contractor. On preparing to excavate for the foundations of the same building, it was discovered that the ground was very soft, yielding, as shown by actual test, under a load of about fourteen hundred pounds to the square foot. The architect was applied to again, and ordered that a footing of concrete should be put in. As the intended building was to be of five stories, with walls eighty feet high, the contractor was, with reason, dissatisfied with this expedient for overcoming the difficulty, but, not venturing to disobey the architect without fortifying himself by good authority, he inquired, first, what a contractor was bound to do in case obedience to the positive orders of the architect seemed to him dangerous; and secondly, how he could, in carrying out such orders, relieve himself of responsibility for mishaps which might follow from obeying them.

TO the first of these questions the editor of *La Semaine* replies that the architect, as master of the work, is solely responsible for the consequences of following out, not only his plans and specifications, but his directions, and so long as the contractor conforms properly to these his responsibility is not engaged at all. In cases where unexpected difficulties come from the nature of the soil the French rule is to hold the builder and architect jointly and equally responsible for damage resulting from their neglect to take the proper precautions against the consequences of this unforeseen contingency; and in the opinion of the editor of *La Semaine* the builder has in this case the right to consult and argee with the architect as to the proper steps to be taken. If the architect is, like the one in question, both ignorant and obstinate, the builder has in such a case the right, as a last resort, to refuse to go on with the foundation, and, on notice to the proprietor, to require the appointment of an expert to determine what shall be done.

IN the third case another correspondent of the paper asks whether the usual clause in contracts providing for the forfeiture by the builder of certain sums as liquidated damages in case of delay is valid, if no reciprocal promise is made by the proprietor. This is a point constantly discussed among contractors here, most of whom maintain that such a clause is invalid unless a promise is made by the owner to reward the contractor in some way for keeping his agreement in regard to the time of completion; or, as we have often heard it expressed, unless the owner agrees at the same time to pay to the contractor, for every day that the building may be completed before the specified time, the same sum that he would exact from him for delay after that period. It is interesting to note that the French law, which is on this point the same as ours, holds that a clause in a building contract which provides for the payment of damages by the builder in case of delay is to be regarded as the expression of the voluntary intention of both parties, and maintained by courts, with the single reservation that the court may determine the actual number of days by which the completion of the work was delayed through the contractor's fault.

A NEW explosive has been discovered by M. Roca, a French engineer, who communicates an account of it to *Le Génie Civil*. The discovery was due entirely to scientific induction from some experiments made upon different specimens of dynamite, with a view to the determination of the effect on the explosive force of the various inert, or at least slowly combustible substances, with which nitro-glycerine is mixed to produce the dynamite of commerce. Of late, in place of the infusorial earth which formed the solid portion of Nobel's dynamite, such substances as sawdust, powdered bark, and even gunpowder, have been used, probably for the sake of economy alone, without, except in the latter case, any reference to the influence which they might have upon the combustion of the nitro-glycerine; but M. Roca, in testing a variety of samples, was struck by the difference among them in regard to energy of explosion, and discovered that if a portion of free carbon, sufficient to combine with the oxygen disengaged from the nitro-glycerine, was present at the moment of detonation, the effect was greater than where, as in the case of gunpowder, the solid portion alone furnished oxygen enough to burn all the free carbon, without calling upon the nitro-glycerine for any. In fact, it appeared from experiment that the dose of carbon might with advantage be so great as not only to be itself oxidized into carbonic oxide by the oxygen of the nitro-glycerine, but to reduce the carbonic acid developed by the explosion of the latter itself into carbonic oxide. The limit of the advantageous effect of free carbon ceased here, and if more were added to the mixture, the cavities formed by the explosion in the lead cubes used for test were found simply lined with soot; but up to the limit necessary for converting all the carbon in the dynamite into carbonic oxide, the addition of a reducing agent was shown to be an important gain. This was confirmed by theory, which shows that pure nitro-glycerine, which is composed of six parts of carbon and two of hydrogen, combined with three times as much nitric acid and water, decomposes on explosion into six parts of carbonic acid, five of watery vapor, one of oxygen and three of nitrogen, while the addition of seven more parts of free carbon to the mixture causes the development, by explosion, of thirteen volumes of carbonic oxide, five parts of watery vapor, and three of nitrogen, or twenty-one volumes of gas in place of fifteen. As the power of an explosive depends principally on the amount of gas which results from its sudden combustion, it was evident that the addition of pure, or nearly pure carbon, in a condition to be readily combined with the other elements, ought to increase materially the force of nitro-glycerine, and M. Roca experimented accordingly with an admixture of sugar, as a highly-carbonized body immediately available, and found that three parts of this, mixed with seven parts of nitro-glycerine, detonated with a force from thirty to thirty-five per cent greater than that of pure nitro-glycerine. Many other organic carbonaceous substances may be employed in place of sugar, with various advantages. In comparing these simple compounds with the celebrated explosive gum, prepared by dissolving gun-cotton in nitro-glycerine, it is found that the latter is far inferior, having an energy very little superior to that of pure nitro-glycerine.

THE *Metal Worker* gives an account of a curious form of heating apparatus in use among the Mennonites of Dakota. In remembrance, probably, of a custom very prevalent in Germany, and perhaps elsewhere, the Mennonites build their houses with four rooms, and at the intersection of the partitions dividing the rooms they build a sort of dome of brick with a chimney above, extending through the roof. The dome stands on four piers, placed in the line of the partitions, so that there is an opening from each room into it, which can be filled up with brickwork at pleasure. In using the furnace, or whatever it may be called, all the openings are closed except one, which serves for the care of the fire, and the rooms without direct access to the fire are warmed by the heated brick walls of the furnace. The German stoves are often set in partitions in the same way, the stove doors opening into a hall or passage, from which the servants can keep the fire in order, while the porcelain or brick sides radiate heat into the rooms on the other side of the partition. In the Mennonite colonies there is, however, special reason for keeping the fire shut out from the best rooms, as the fuel used is hay, which makes a dense and suffocating smoke on first lighting, and leaves a great deal of light ash to be blown about the room. At first sight this would appear to be one of the most unmanageable and inconvenient of fuels; but the hay is prepared by twisting very tightly while fresh or moist into ropes, which retain their shape when dry, and form a tolerable substitute for wood, burning so slowly that the furnace requires replenishing only two or three times a day. Cooking may be done with the same fire, by taking out a part of the brick wall of the furnace in one of the rooms not used for feeding the fire. An iron box is inserted in the hole, and the brickwork made tight around it, and the oven so formed is available for any purpose.

STATUES AND MONUMENTS OF LONDON.[1] — II.

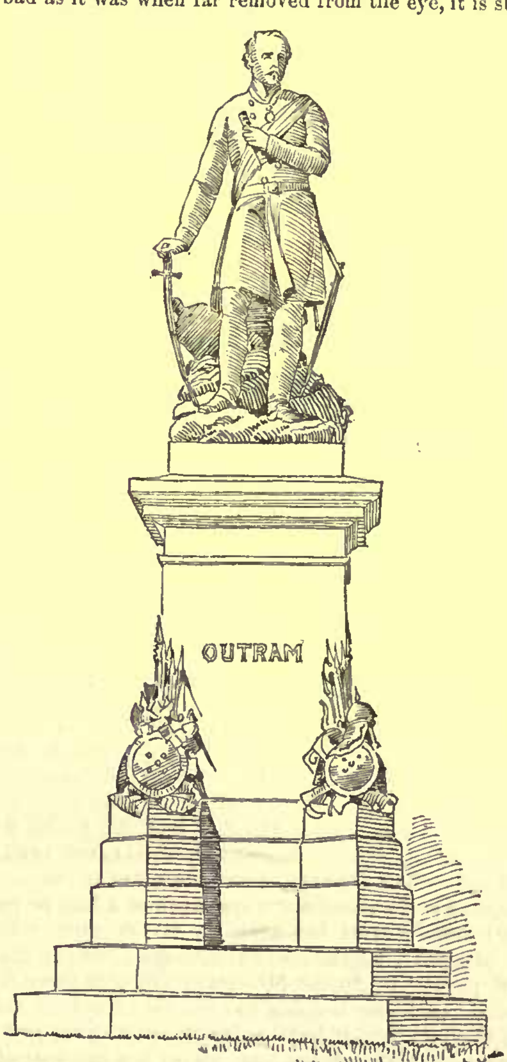


General Havelock, Trafalgar Square, 1861. Behnes, Sculptor.

OF military heroes whom London has delighted to honor, there are two statues of the Duke of Wellington, the one in front of the Royal Exchange by Chantrey [see Illustrations] fully up to the usual level of dignity of this sculptor, and the other by Wyatt, a monstrous colossus, lately on the top of Decimus Burton's arch at Hyde Park Corner. On the recent removal of this arch, the members of the Royal Academy unanimously petitioned that this statue should not be replaced over the archway, where its position, they said, was utterly opposed to every canon of art, and in accordance with this the Government decided that the statue was not to be re-erected on the arch. Its descent, however, has rather aggravated than reduced the difficulties connected with the statue; bad as it was when far removed from the eye, it is still worse



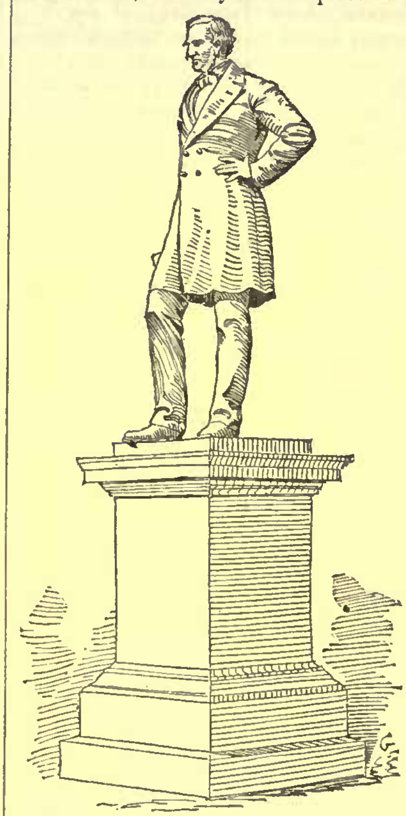
Sir Charles James Napier, Trafalgar Square. Adams, Sculptor.



James Outram, Thames Embankment, 1871. M. Noble, Sculptor.

when brought within nearer range of vision; its details are even worse than its composition as a whole; its colossal size makes it most difficult to find an appropriate place for it. On a pedestal in its present position at Hyde Park Corner it would overtop and dwarf everything else, and make it impossible to decorate further this place. A committee composed of the most eminent advisers on such a subject that could be named, and including the present Duke of Wellington, have recommended that the statue should be recast, and that another statue should be made of the great Duke, of the ordinary heroic size, better adapted to the place where, above all others, it is fitting that it should be erected.

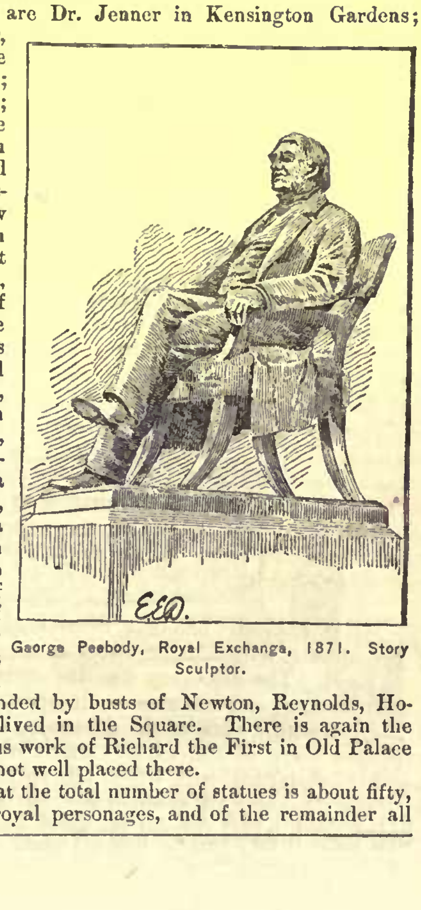
Lord Nelson at the summit of the well-known column [see Illustrations] in Charing Cross, around which Landseer's very sketchy lions watch; the very commonplace statues of Havelock by Behnes, and of Napier by Adams those of Lord Clyde by Marochetti [see Illustrations], and Sir John Burgoyne by Boehm, in the Garden of Carlton Terrace, and Sir James Outram on the Thames Embankment; the military trophy [see Illustrations], in commemoration of the Crimean War, of three guardsmen surmounted by a gigantic Victory holding out wreaths in both hands, well satirized by *Punch* at the time as the "quoit-thrower," a most gloomy erection by John Bell, and the graceful column by Gilbert Scott in front of Dean's Yard and the Abbey in honor of the Westminster School contribution to the roll of honor in the same war [see Illustrations]; the so-called Achilles in Hyde Park [see Illustrations], a copy of a statue at Rome, palmed off upon the ladies of England, and erected by them as a tribute to the Duke of Wellington, complete the list of military monuments.[2]



John Stephenson, Euston Square, 1871. Marochetti, Sculptor.

The Thames Embankment appears to have given a great incentive to the statuary art. John Stuart Mill, an interesting likeness by Woolner, almost too realistic, and which reminds one especially of his customary attitude in the House of Commons, has been placed there. Statues of Raikes the founder of Sunday Schools, and of Brunel the engineer, and perhaps the worst example of modern statues, have also been erected in these gardens; while in the gardens at the back of Carlton Terrace leading to Pall Mall are Sir John Franklin [see Illustrations], a statue than which few are regarded with greater interest by the public, and Lord Lawrence [see Illustrations], a by no means satisfactory figure, in an attitude singularly at variance with his dignified and modest demeanor.

Elsewhere in London are Dr. Jenner in Kensington Gardens; Stephenson, the engineer, in Euston Square; George Peabody in the City; Cobden in Camden Town; Lord Byron, a statue quite unworthy of its site in Hamilton Gardens; Lord Herbert of Lea [see Illustrations], one of the few productions we have in London of Foley, a most poetic conception, refined, graceful and full of thought; and the more recent statue of Thomas Carlyle by Boehm, erected in Cheyne Walk, Chelsea, near to the house in which he lived so long, and one of the most interesting statues of the day, a model in design, likeness, and place, of what a memorial to such a man should be. There is also a statue in marble of Shakespeare, a copy of that in Westminster Abbey, erected at the cost of Mr. Albert Grant in Leicester Square, surrounded by busts of Newton, Reynolds, Hogarth and Hunter, who lived in the Square. There is again the imaginative and chivalrous work of Richard the First in Old Palace Yard by Marochetti, but not well placed there.



George Peabody, Royal Exchange, 1871. Story Sculptor.

It will be seen, then, that the total number of statues is about fifty, of which eighteen are of royal personages, and of the remainder all

[1] A paper by Mr G. Shaw Lefevre, reprinted, with added illustrations, from the *Nineteenth Century*. Continued from page 53, No. 475.

[2] See note at end of article.

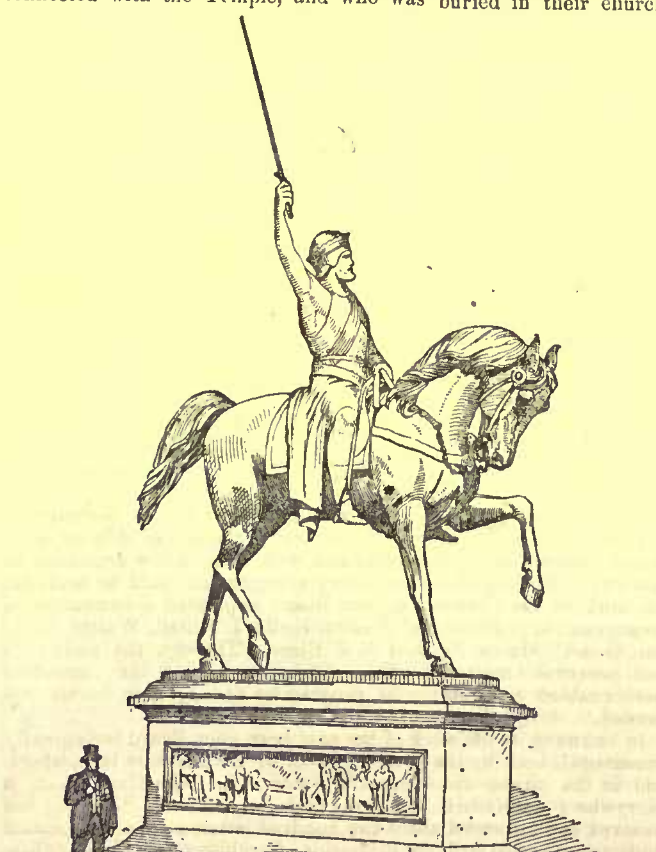
have been erected within the present century, and by far the larger proportion in the last twenty years. There are no statues of the greatest of English warriors, of Edward the Third, or Henry the Fifth, or Blake, or Marlborough. There is none of Cromwell. Chatham is equally without tribute of this kind. Milton, in spite of his association with London, has no recognition except that of a bust in the Abbey. To Dr. Johnson a statue has been erected at Lichfield, the place of his birth, but none in London, where nearly the whole of his life was passed, and where he died. The statues by Foley of two celebrated Irishmen, Burke and Goldsmith, erected in front of Trinity College, are among the very best works of art of modern times, but in London, where their lives were spent, there are no statues of them in the open air. It was at least to be expected that the Benchers of the Temple Inn would have done something in honor of one who was so long connected with the Temple, and who was buried in their church.



The Byron Memorial, Hyde Park, 1879. T. Belt, Sculptor.



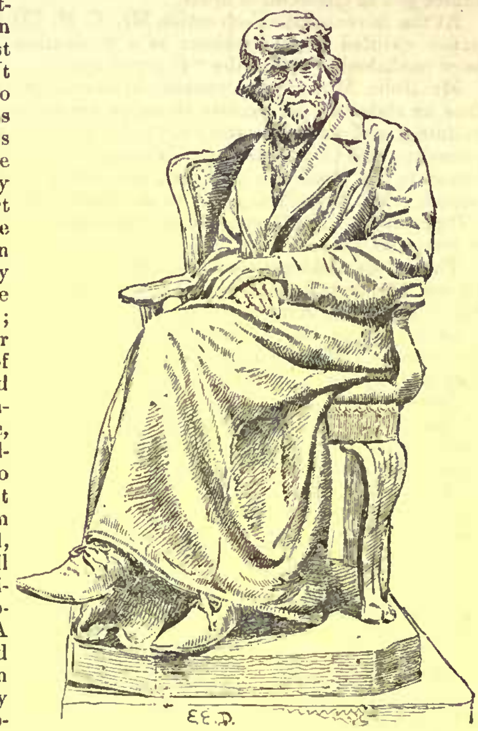
Lord Herbert of Lea, Pall Mall. Foley, Sculptor.



Richard I, Old Palace Yard. Marochetti, Sculptor.

A statue of Charles Dickens in some one of the many parts of London identified with his works would be appropriate. Compared with these it may well be doubted whether many of those to whom statues have been erected in the last twenty years are worthy of the honor. It is a question whether any statue should be erected until ten years or more have elapsed since the death of the subject. This would avoid many which are decided upon in the excitement of grief and regret immediately after death. What is still more to be deprecated is the erection of a statue during the life of its subject, except perhaps in the case of the most eminent.

In any case it is not desirable that statues should be multiplied unduly. In the view of many people, London, by reason of its climate, is unsuitable for statues in the open air, at least without canopies. It may be replied to this the suitableness of a statue depends wholly upon the work itself. Really good works of art like the best of those which have been named are certainly not out of place even in London; they rise superior to the conditions of the atmosphere and to their environment. A bad statue, however, is intolerable; there is no escape from it; it adds to the gloom of its neighborhood, it intensifies all other bad conditions, and is a public misfortune. A statue once erected in a public place can be removed only under most exceptional circumstances. Too great care, then, cannot be taken by the authorities in consenting to the erection of a statue. There is nothing of which it is more difficult to judge the effect in advance. The small model of a statue may please, the full-sized cast in the studio may look well, but when the final result in bronze or marble is put on its pedestal in the place of destination, the result may be eminently unsatisfactory, and perhaps to none more so than to the artist himself. It may be a question whether, before giving final permission for the erection of a statue, it ought not to be required that a model in plaster, colored to represent bronze, should be placed on the intended site, and whether a committee of taste should not be the final arbiters in a matter so delicate and difficult.



Thomas Carlyle, Cheyne Walk, Chelsea. Boehm, Sculptor.

REPORT OF THE BOARD OF TRUSTEES, A. I. A.

American Institute of Architects,
Secretary's Office, 10 Catherine Street,
Newport, R. I., January 28, 1885.

To the Editors of the American Architect: —

Dear Sirs, — I enclose herewith, for publication in your journal, the Report of the Board of Trustees, A. I. A., presented at the Albany (eighteenth) Convention, October 22, 1884.

American Institute of Architects,
Secretary's Office, 10 Catherine Street,
Newport, R. I., October 20, 1884.

To the American Institute of Architects: —

The Board of Trustees for the year 1883 held four meetings after the Providence-Newport Convention, and your present Board has

John Churchill's Statue. — The Duke of Rutland lately threatened to resign his peerage if the statue of the Duke of Wellington were dishonored by removal to Aldershot. What would he say if he saw the statue of as great a man in his day, the wonderful monument erected to the Duke of Marlborough, which stands in Marlborough Square, Chelsea. There, overlooked by houses inhabited by cabmen, in a circle which should be a garden but is only a waste, shaded by the trees which still hint that what is now a barren desert was once a bit of refreshing green, stands one of the most remarkable of the memorials of the Flamboyant Georgian era. A figure in a full flowing bottom wig, surmounted by a helmet of a late period, and enveloped in the Roman toga, is tilted forward on its defaced pedestal. Its pose is not without dignity, and its main lines are graceful. The faithful British lion, about the size of a mastiff, bounds at the figure's feet in affectionate intimacy. This is what remains of what was once a representation of the Duke of Marlborough. For some years it has been made the target for the cockshies of Chelsea boys, and in consequence it is difficult to trace any resemblance to Lord Randolph Churchill in the battered features. Imagination enough, however, to put a moustache on this Roman in a wig sees a great likeness. There is some talk of a movement to rehabilitate the garden and restore to some extent the statue, but in the presence of the failure of the London Government bill, it is hardly likely that anything will be done, unless the Fourth Party take up the matter and restore the statue in honor of the distinguished ancestor of its distinguished leader. Mr. Shaw Lefevre will do nothing. He has enough to do with the other Great Duke, and has not time to take up the fine carving which once graced the walls of Burlington House from the dust of Battersea Park.—*London Letter to the Liverpool Mercury.*

held nine regular, one adjourned, and one special meeting, eleven in all, which have been fairly well attended, with the exception of two, at which no quorums were present. Five of the above meetings were held in the office of the Treasurer and ten in the Institute room, No. 81 Bryant Building, New York City.

At the Seventeenth Convention, several matters of importance were referred to your Board and have received the attention of its members, collectively and in committees; the results will be laid before you in consecutive order.

At the Seventeenth Convention Mr. T. M. Clark of Boston read a paper entitled the "Architect as a Sanitarian." This paper has been published in full in the "*Proceedings*."

Mr. John Moser, of Anniston, Alabama, presented at the same time an elaborate perspective elevation for an Institute of Architects building, with an explanatory key. In accordance with a resolution passed by the Convention, this drawing, with its key, has been published in the *American Architect*, but owing to the impossibility of reducing Mr. Moser's drawing to the dimensions of the pages of the "*Proceedings*," the Committee on Publications were obliged to omit it from that volume.

The annual Address at the Seventeenth Convention was delivered by the President in person; it has been published in the "*Proceedings*," and in the *American Architect*.

In preparing the "*Proceedings*" for publication, the Committee has endeavored to render them as full and accurate as possible; they also, by vote of the Board of Trustees, inserted as an appendix a photo-caustic of a group of twenty-eight of the architects present at the Seventeenth Convention. Copies of these "*Proceedings*" have been sent to all Fellows and Associates, and to such other architects and laymen who have from time to time applied for them.

At a meeting of your Board, held on the second of July, it was voted to send a circular to all Fellows and Associates, requesting those who might be in possession of duplicate copies of the "*Proceedings*" of the seventeen conventions of the Institute to contribute them towards filling up the breaks in the existing files (Appendix A). The result has been highly satisfactory, the larger number of duplicates coming from a past Secretary of the Boston Chapter.

The Report of the Treasurer will be laid before you in due course.

By the exercise of strict economy and the performance of much clerical labor by the executive officers of the Institute, the routine expenses for the past year have been met in full and much good work accomplished. Your Board would call attention to the necessity of making some special provision for defraying the annual rent of the Institute room in the Bryant Building.

To meet this annual rental, the regular funds at the disposal of the Treasurer are inadequate. Up to January, 1884, this room was occupied on sufferance. At a meeting held on October 23, 1883, it was voted to send a circular letter to each Fellow and Associate, requesting financial aid to the amount of two hundred and fifty dollars, for the rent of room for the current year. This circular (Appendix B) was in general well received, and numerous subscriptions forwarded to the Treasurer. These subscriptions, and a guaranty fund provided by three members of your Board, enabled the Trustees to lease the room for one year.

While thus responding to the present needs of the Institute, many of the subscribers stated that in their opinion the matter should be brought before the Convention, and some permanent provision made for defraying the Institute rental from the general fund, and not by the individual subscriptions of members. Your Board would therefore call your attention to the importance of providing a fund for the Institute rental, a matter which it deems to be one of vital interest, and one closely allied to its general work and influence.

The sub-committee of your Board on a revision of the Schedule of Charges, Mr. Napoleon Le Brun, reported progress at the Seventeenth Convention, and was continued to the present meeting. The report of Mr. Le Brun has now been printed and distributed to members, and will be laid before you for action. (Appendix C.)

For temporary use, a new edition of one thousand copies of the present Schedule has been printed during the past year. (Appendix D.)

Since the members of the Institute last met in convention, there has been a marked increase in the numbers of both the Fellowship and Associate grades. Six Associates have been promoted to Fellowship, viz.: Messrs. Arthur Rotch, W. G. Preston, M. Fred Ball, W. C. Smith, Edward H. Kendall, and E. Townsend Mix.

By first election six Fellows have been added to the roll, viz.: Messrs. A. H. Stem, J. H. Stem, E. J. Hodgson, James G. Cutler, R. W. Gambier-Bousfield, and John Ord. Twelve Associates have been elected, viz.: Messrs. P. L. Le Brun, Leoni W. Robinson, H. W. Kirchner, B. H. Enos, Charles G. Mueller, W. S. Wicks, Edmund R. Willson, F. W. Vogdes, J. McDonnell, F. W. Humble, Eugene H. Taylor, and David L. Stine.

As a matter of discipline, two Associates have been dropped from the roll. One Fellow has died during the year, leaving the net gain on the list of membership for the year, to date, fifteen. There are now on the roll of the Institute eighty-one Fellows and ninety-six Associates, a total membership of one hundred and seventy-seven. Several applicants for both grades are now awaiting the action of your Board.

More than a passing notice should be given to the death of our late Fellow, Henry Fernbach, who died in the city of New York, on the 12th day of November, 1883. Mr. Fernbach was an ardent friend of the Institute, thoroughly believing in the advantages of membership therein, and aiding its advancement by all the means in his power. He was one of the oldest members on its roll, having been elected to Fellowship, June 25, 1866.

At the Seventeenth Convention several radical changes in the manner of electing Fellows were adopted, and all restrictions upon the number to be enrolled in that grade removed. The experience gained during the past year seems to vindicate the wisdom of that action. An increased interest in the work of the Institute has been developed and stimulated in all parts of the United States, and even in the Dominion of Canada. Applications for membership have been frequent, and each case has been carefully investigated before action. The lists of questions in regard to applicants for Fellowship have been regularly sent out, and have elicited replies, giving full and reliable information in regard to the character and professional fitness of the candidates.

Two Chapters have been added to our Institute Union: the St. Louis Chapter was admitted on the 16th of April, 1884; the Indiana Chapter, with headquarters at Indianapolis, on the 2d of July, 1884. The Secretary is now in correspondence with architects in Nashville, Rochester, Detroit and Buffalo, where the formation of Chapters is in contemplation. The rehabilitation of the Albany Chapter is also hoped for.

Under date of April 5, 1884, the editors of the *American Architect* published an "*open letter*" to the profession on the subject of competitions. This letter (Appendix E) formed the text for much discussion among architects in general, and several Chapters of the Institute intimated a desire to have some action taken in reference to the matter by the Board of Trustees.

Your Board, in compliance with these intimations, prepared a circular on the subject, including a reprint of the "open letter," requesting the recipients to consider the points discussed in this letter from the standpoint of their own views and experiences in connection with competitions, both open and limited, and communicate the results of such consideration to the Secretary of the A. I. A.

These circulars were distributed not only among all the members of the Institute, but to one hundred architects not members of our body. Many replies have been received from Institute men and others, nearly all endorsing the scheme proposed. Several respondents suggested amendments, and a few disapproved of the action altogether, on the ground that the system of calling for competitive designs was radically wrong. Your Board believing that the question of competitions, as brought forward in the "open letter," is an important one, voted to bring the subject to the attention of the Eighteenth Convention, through its Annual Report.

During the past year calls for copies of the "*Proceedings*," both for single numbers and for full sets, have been unusually numerous, both from individuals and from public libraries, including the Bibliothèque Nationale, at Paris. As far as possible these calls have been met, but the earlier numbers of the "*Proceedings*" are now nearly out of print, and it is difficult to meet the requests on file.

From the United States Department of the Interior a request has been received for a history of the Institute since 1875. Owing to the multiplicity of duties devolving upon the Secretary, this history has not yet been prepared.

In compliance with a request from the Secretary of the New York and New Jersey Branch of the International Institute, for preserving and perfecting Anglo-Saxon Weights and Measures, that your Board delegate one of its members to attend a meeting of conference relative to a representation at the Meridian Congress at Washington, D. C., Mr. O. P. Hatfield was requested to attend the meeting informally, and to report its proceedings. Mr. Hatfield's report is not given herewith, in view of the fact that a member of the International Institute is expected to be present at the Albany Convention, and present to your notice the aims and objects of the Society which he represents.

In accordance with a general wish expressed at the Seventeenth Convention that the eighteenth be held in the city of Albany, your Board entered into correspondence with their fellow architects in that city. Finding that satisfactory arangements could be made for the work of the Convention, your Board appointed a committee on arrangements, consisting of Messrs. Emlin T. Littell, Walter Dickson, Geo. C. Mason, Jr., and A. J. Bloor. Through the assistance and generous hospitality of the Albany architects, the committee were enabled to present the programme of exercises hereto appended.

In summing up the work of the past year, your Board feels greatly encouraged, both by the steady growth of the Institute in numbers, and in the strong and increasing interest in its welfare which is everywhere manifested. Since the last convention the Secretary has received and answered about two hundred letters on the most varied subjects connected with the profession of architecture. The applications for membership are constantly increasing, and were the Institute possessed of the necessary financial resources, the work and influence would be greatly enhanced. As it is, the Institute is rapidly becoming a power for good. The formation of new Chapters in the larger cities of the Union disseminates a more general knowledge of our aims and objects among the laity who form our clientage, and the members of the Institute, individually and collectively, feel the stimulus of mutual association and respect.

Respectfully submitted for the Board of Trustees.

GEO. C. MASON, JR., Secretary, A. I. A.

Since October 20, 1884, the following additions have been made to the Fellowship and Associate grades of the Institute.

Fellows by promotion. — Messrs. W. L. B. Jenney, Chicago, Ill.; David L. Stine, Toledo, O.; James Murphy, Providence, R. I.

Fellows by first election.—Messrs. F. M. Whitehouse, Chicago, Ill.; Franklin H. Janes, Albany, N. Y.; Robt. W. Gibson, Albany, N. Y.

Associates. — Messrs. John J. Deery, Philadelphia, Pa.; F. B. White, New York, N. Y.; Adolph Fleischman, Albany, N. Y.; Franklin J. Sawtelle, Providence, R. I.

Applicants for both grades are now awaiting action by the Board of Trustees. Very truly yours,

Geo. C. Mason, Jr.,
Secretary, A. I. A.

THE BENNINGTON BATTLE MONUMENT.


The Barn to Mr White's House Brookline: Mass. Messrs Peabody & Stearns Archts

THE indifference in this country to the merits of public monuments as works of art has become so general that any consideration of them beyond a statistical statement of their size, weight and cost with the usual friendly commendation of the prudent critic, seems out of place even in an art journal.

It is perhaps because of this indifference, that the projectors of these structures are emboldened, not only to propose and execute novel designs, but to promulgate novel opinions concerning monuments, architecture and art generally.

In accord with this sort of literary attachment to monumental construction is the report of the committee appointed by the Bennington Battle Monument Association. This report is, we venture to affirm, the most remarkable document ever written on any art subject. On another occasion we shall remark upon it at length as an example of what may be accomplished in a new field. For the present we wish simply to refer to a few points.

The report confines "monumental construction" to "two methods," one to "size and grandeur of dimension," the other to "artistic conception and execution." The first being "altogether architectural," the second, "principally sculptural," and it affirms that architecture and sculpture "cannot be successfully combined" in monuments, that it has "always failed," and is not likely to succeed.

The authors of this report forget that there are as many varieties of "monumental construction" as there are varieties of genius among artists, and that the old world is replete with examples. They also forget that all recognized monumental structures, like the towers of Italy, Trajan's Column, the Column of the Bastile, the Egyptian Obelisks, the Great Pyramid and other famous monuments known to the world are regarded above all as great works of art, and their "size and grandeur of dimension" receive adoration because they exemplify the same elements of true art that are possessed by the best antique statues, and not because they have "size and dimension" as pieces of masonry. Monuments combining architecture and sculpture are among the most treasured objects of art, and their number is legion. There is hardly a church in Europe that has not one, and sometimes many examples, and they represent a combination of genius excelled in no department of art. If it is true that architecture and sculpture have not been successfully combined, what a sorry mistake the art and learned world has made in its love for the works of India, Assyria, Egypt, Greece, Italy and France. So too, the dwellers in the vicinity of these noble works, unlearned for the most part though they be, must be condemned for the admiration and pride in which they have been wont to hold these objects of their affection.

It is somewhat startling to hear that the sculpture on the temples, palaces and churches, and on the monuments in the open air in these countries, is in the language of this report, "a mere insignificant detail and embroidery," "frittering away the simplicity and singleness of purpose upon which their effect depends." It is left to the civilized American to thus tear away one of the delightful delusions of art, and to deprive a considerable part of mankind of one of its choicest comforts.

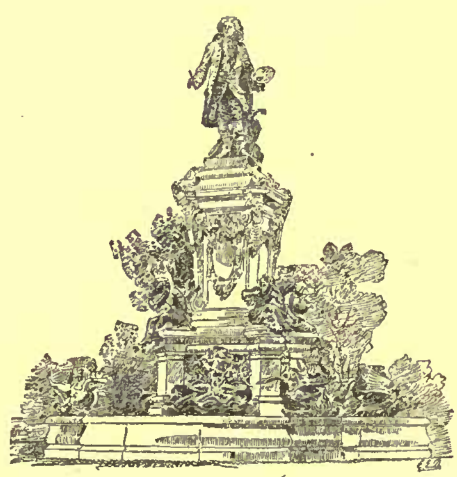
Not only is the report dissatisfied with ancient monuments, but it would cruelly discourage any possible originality; for it says that "it is out of the question" to discover "a new or original method" of reaching a height of several hundred feet in a monumental structure. It might add that, taking the human form as a model, it would also be out of the question to make a new or original statue. And yet fine towers, obelisks, columns and statues are continually being added to the world of art, that artists and those who love art are content to think, do express "new and original" ideas through "new and original" forms; and it is thought that the form of the tower, the obelisk and column are no more conventional than the human figure, all being subordinate to the mind of man, to be used as he pleases, rather than governing him by any arbitrary principle of art.

The committee is not happy in its mention of tower and column monuments as examples of art. The Nelson Monument, the Duke of York's Column, the Towers of the New Houses of Parliament, and those of the Brooklyn Bridge, have not been classed among the best specimens of those styles of monuments. Perhaps it was not worth while to cite those well known, as they had already as a mass been condemned in the report in the following climax of destruction of all forms of ancient monuments. "No instance of either of these forms of monuments has yet been successful in commanding general admiration, or in filling the measure of desired expression." The reason given for this failure is that "They tell no story; they appeal to no sentiment; their lips are silent; rather they have no lips and no voice."

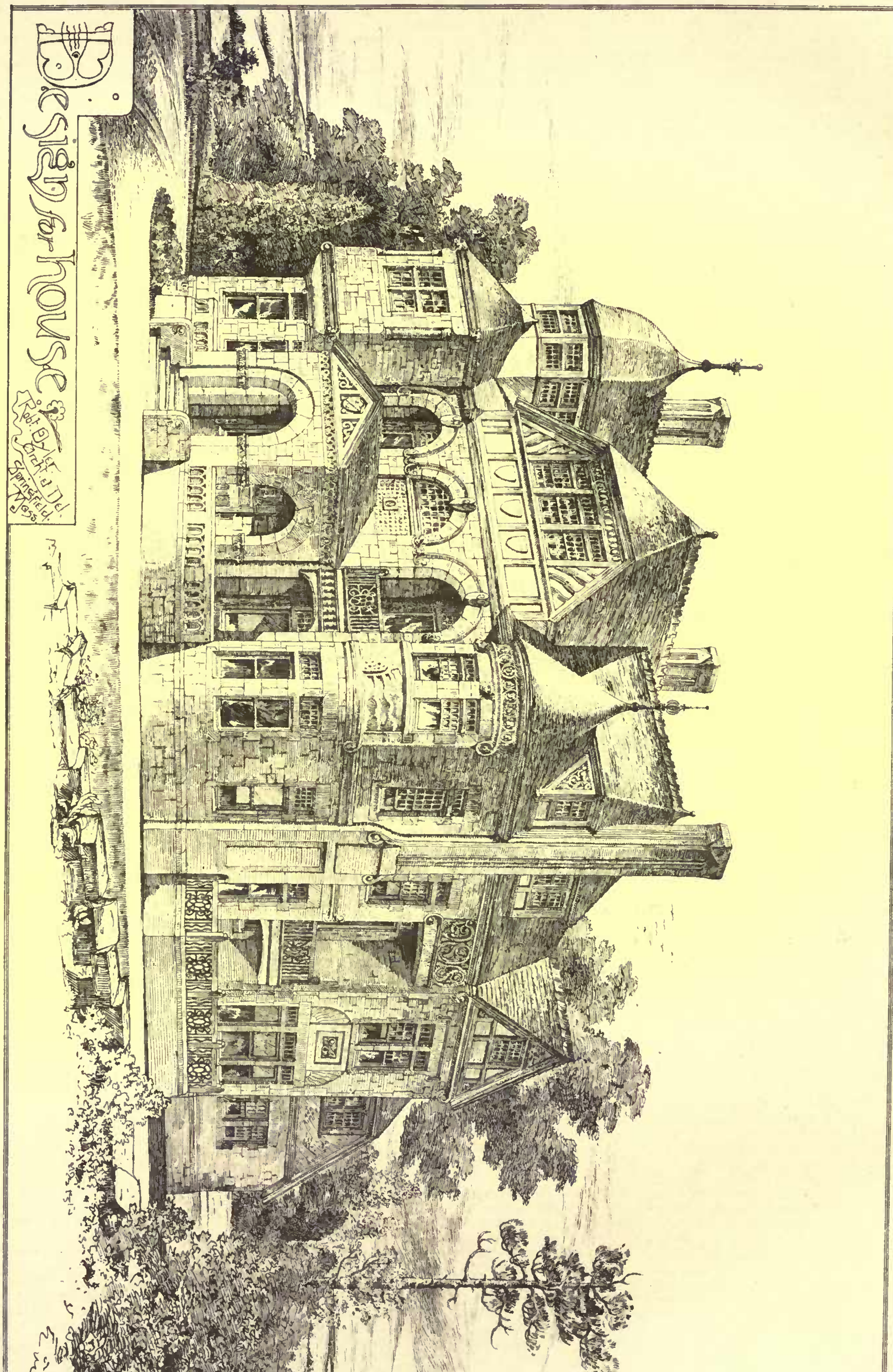
It seems incredible that any one could make such statements; and also a waste of time to answer them; yet it is just such amazing misinformation that every department of art is obliged to combat in this country.

It needs but little intelligence to condemn the structures cited in this report; but little more to have named others that in some way have spoken to all the world. The monument to Frederick the Great seems to have a voice; that of the Republic, in Paris, the Versailles Monument, the projected one to Gambetta, and many others seem to speak; and they are monuments composed of architecture and sculpture. The Column of the Bastile has not been so far regarded as a silent object. Of towers that commemorate and keep alive the dearest memories there are many. Not content with sending all the monuments of the world to perdition, the report also sits heavily upon poor architecture, as follows: "Of all the subjects of human exertion, architecture has, in its external qualities, displayed the smallest modern advances, because its supposed advances have generally failed to stand the test of time."

FISH AND SEWAGE.

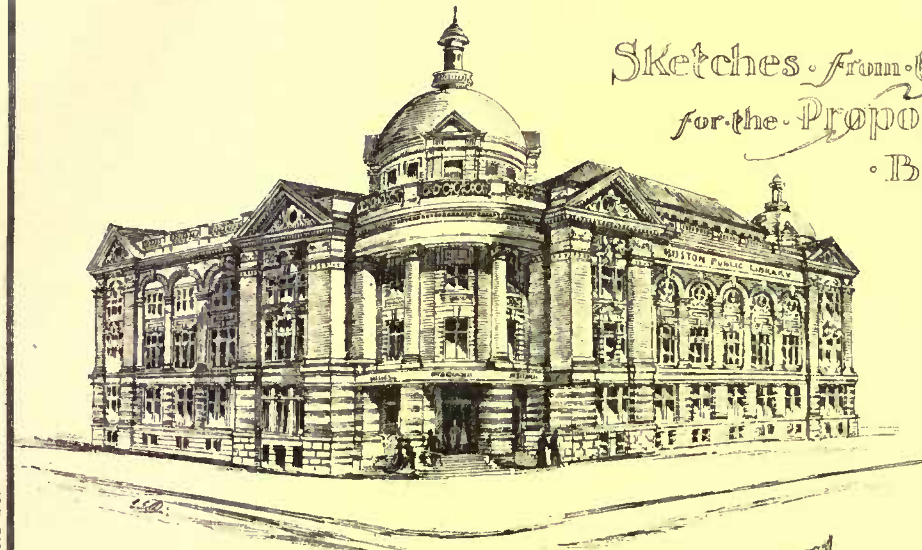

Monumental Fountain to Watteau Valenciennes France designed by Carpeaux: exd by Fiolle:

THE suggestion that the conveyance of sewage to the sea may, after all, says the *Times*, be the most profitable method of turning its constituents to account will appear to most readers to possess the merit of absolute originality. It is not put forward to-day for the first time, since Sir John Lawes tells us that he foreshadowed it in his evidence before the Royal Commission; and he now sets forth in some detail the leading facts on which he relies. Broadly stated, these are that fish must live upon something; that their great abundance upon the eastern and southern coasts of England, as compared with the western coast and with the coast of Ireland, supports the belief that their food is not derived entirely from materials native to the sea; that their bodies contain nitrogen, phosphoric acid and potash, substances in which sewage is rich, and from which it derives its manurial value; and hence, in plain words, that we may possibly do better by manuring the sea with our sewage for the purpose of raising a fish crop than by manuring the land with it for the purpose of raising crops of corn or grass. Assuming that an acre of land, under favorable conditions and with abundant help from manure will yield a ton weight of corn annually, he tells us, on the unimpeachable authority of Professor Huxley, that an acre of good marine fishing ground will yield a ton weight of fish weekly; and he quotes analyses to show that the flesh of fish does not differ materially in composition from that of store cattle, although, when compared with cattle ready for killing, it is deficient in fat. As long as fish are only eaten by one another the materials for their growth are not removed from the river or sea in which they live; but when six hundred thousand tons are caught annually by British fisherman alone, to say nothing of foreigners, and are either eaten by mankind or scattered over the fields as manure, the constant removal of fish material from the water must be supplied from some source or another if fish are to continue to multiply, or even to exist. They live not only upon smaller fish, but also upon innumerable forms of marine animals, and upon marine vegetation; and there is no reason to suppose that what may be called the oceanic supplies of food are illimitable. On the contrary, it is more reasonable to believe that the sea, like the land, can be exhausted of the materials by which life is supported; and that these materials,

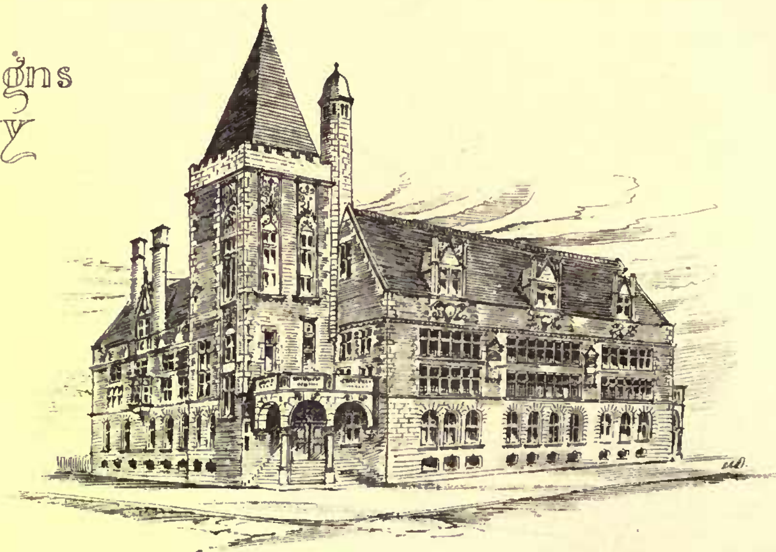


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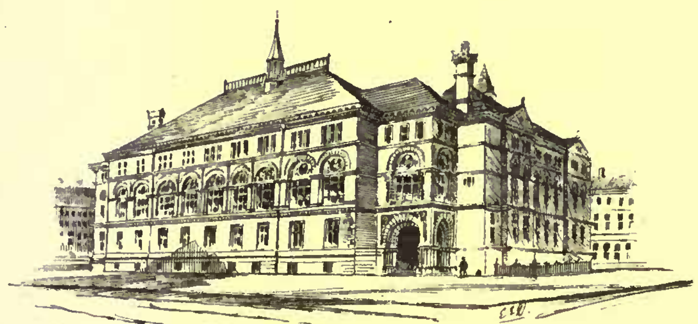
Sketches · from · the · Premiated · Designs for · the · Proposed · Public · Library · Boston · Mass ·



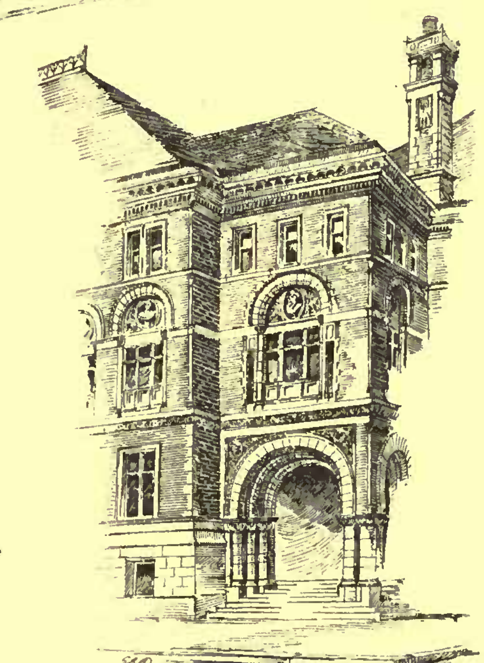
First · Prize · Design · Mr Charles · B · Atwood · East · Orange · N · J ·



Third · Prize · Design · Mr · Clarence · S · Luce · New · York · City ·



Second · Prize · Design · Messrs O'Grady · & · Zerrahn · Boston · Mass ·



Detail · Sketch · of 2nd Prize Design ·



Fourth · Prize · Design · Mr Horace · F · Burr · Boston · Mass ·

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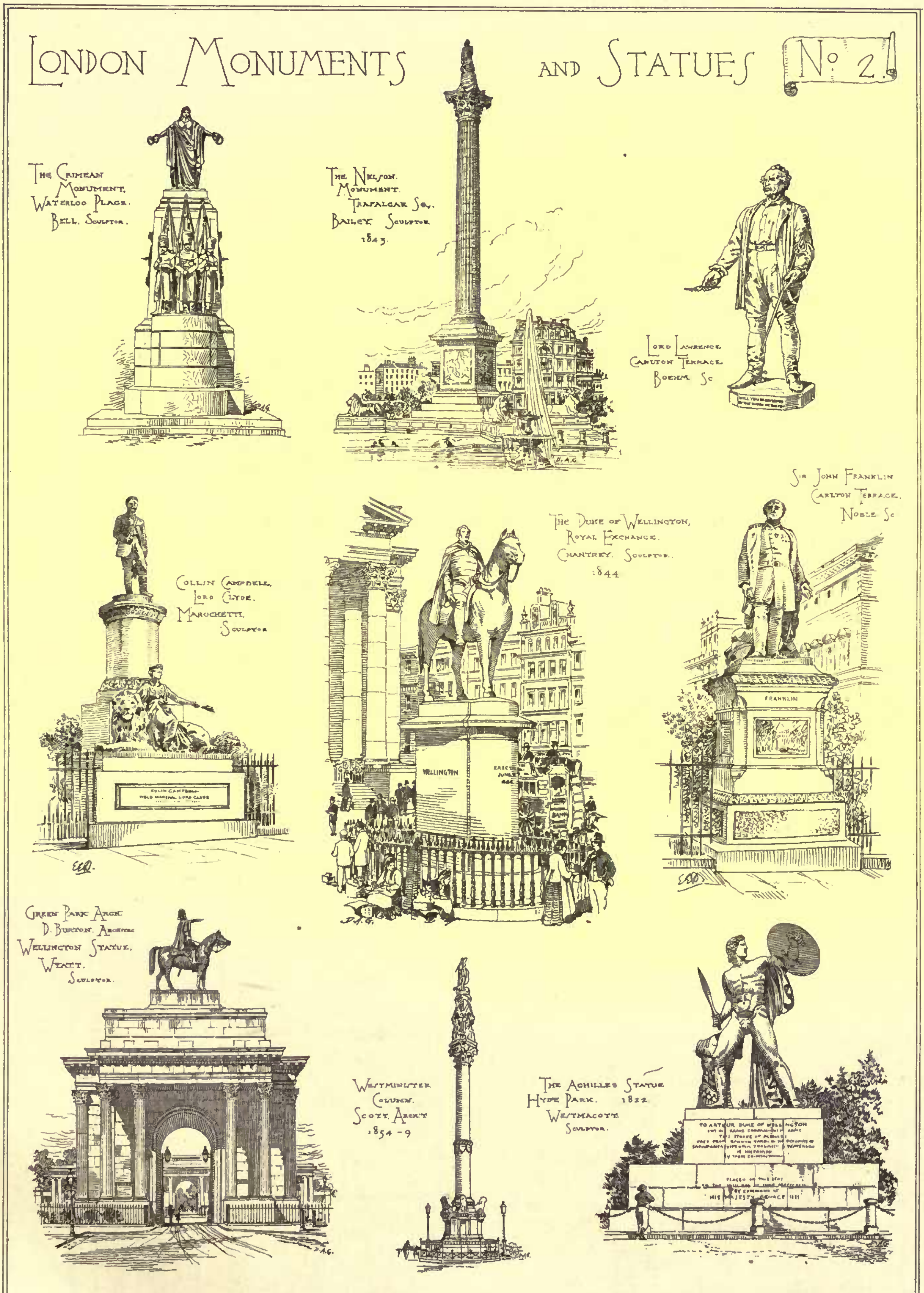
A. J. Cooper
Jas. D. Carson } Owners.

Adams Express Building — Chicago,

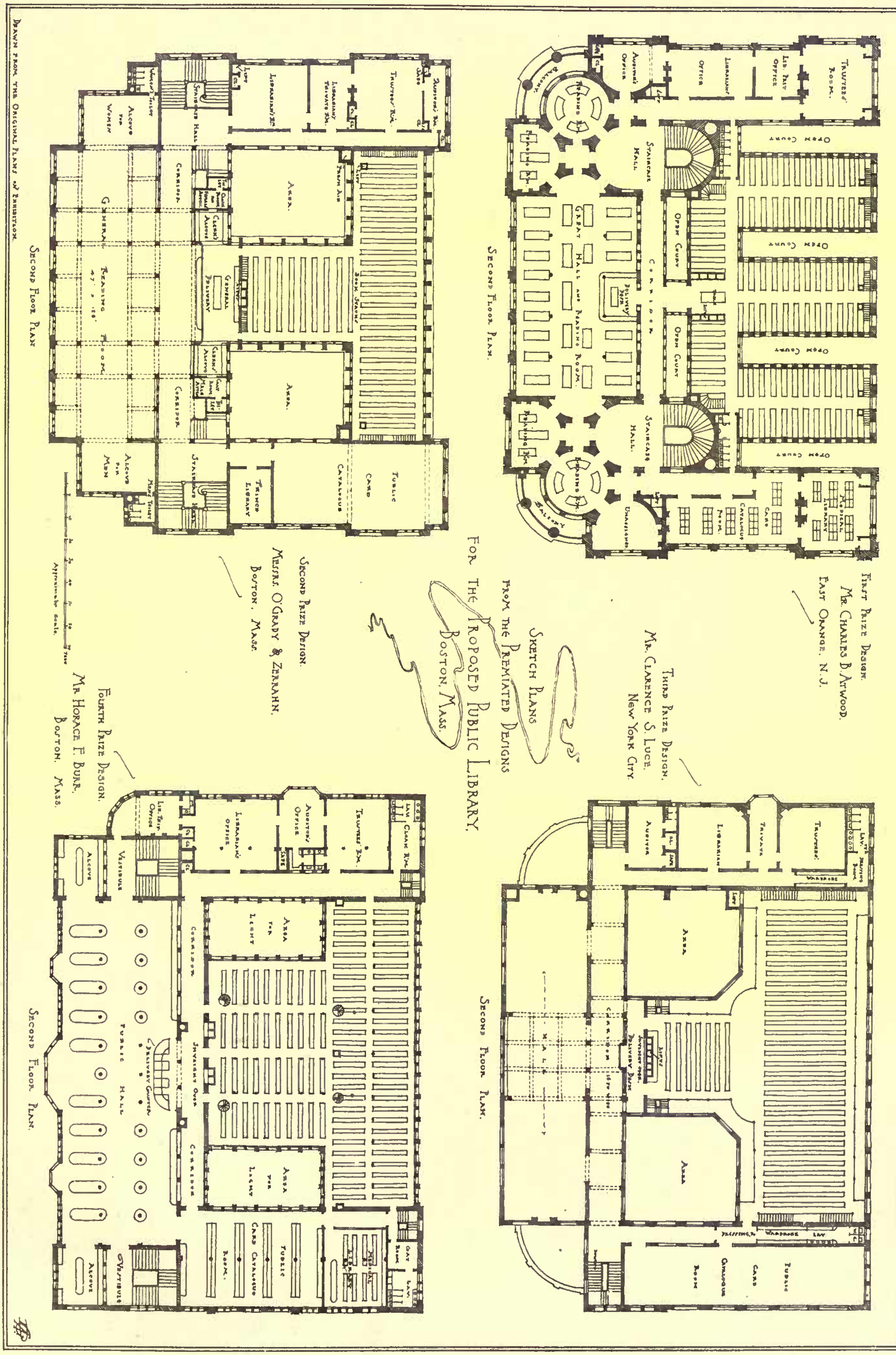
183 to 189 Dearborn St.

Geo. H. Edbrooke, Architect.

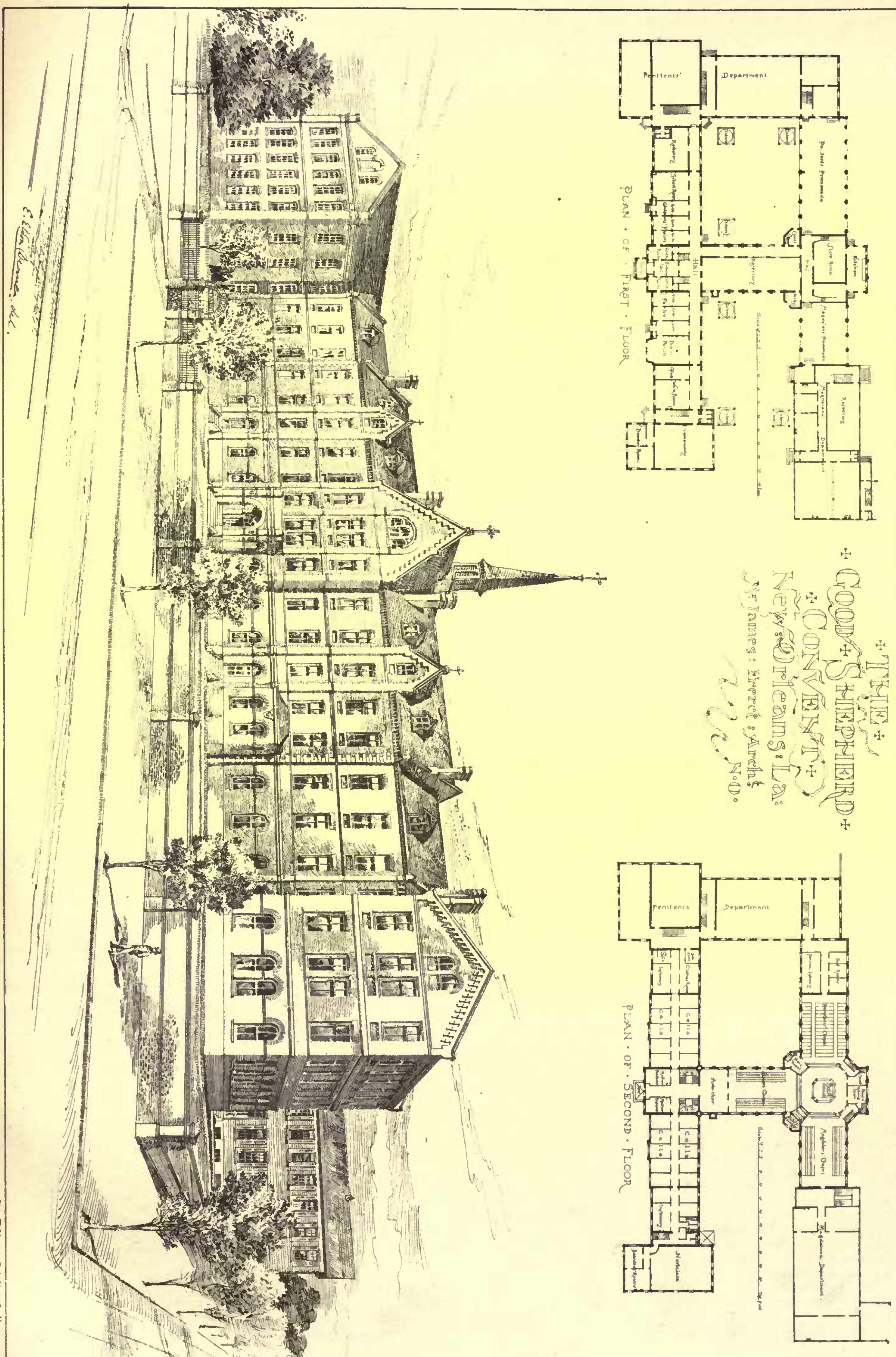
American Architect and Building News, Feb. 14 1885 No. 477



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The Heliotype Printing Co. Boston.

however abundant, are still present in definite quantity, so that their constant removal must be balanced by an equally constant replacement if the growth which they occasion and support is to be continued without stint. At present the yield of fish on the eastern and southern coasts is annually increasing; and Sir John Lawes suggests that the increase may be due, in all probability, to the abundant nutriment which our methods of sewage disposal cause to be poured into the sea. He supports his argument by citing cases in which river fish have manifestly thriven in consequence of a supply of drainage; and all anglers are familiar with the fact that the point of entrance of a drain is usually surrounded by a number of fish feeding eagerly upon the materials which are brought down.

The problem of determining the best way of utilizing sewage upon land has long been the despair of all who have devoted themselves to its solution. Most people can remember, many have cause to remember only too well, the not very distant time when sanguine promoters of companies were declaring sewage to be an inexhaustible source of wealth, and its profitable employment to be the easiest of all undertakings. The late General Scott, with a practical sagacity which time has justified, maintained an opposite view, and declared that the manurial elements of sewage, however valuable in the aggregate, could only be brought into a form fit for use at a cost which would be in excess of their value. He admitted that the manure contained in a given quantity of sewage might be worth a pound, but added that it could not be placed on the land for less than a guinea, and that all hope of profit from sewage was chimerical. The reason he assigned was not only the great comparative bulk of the water in which the valuable materials were suspended, but also the presence of quantities of road drift and other inert substances — "profligate associates," as he used to call them — by which the difficulty of separating what was useful was greatly increased. He said that the domestic comfort afforded by a system of water-carriage must not only be paid for by the loss of all profit on the material, but that urban householders must think themselves fortunate if they could dispose of their sewage at only a trifling expense. Where, as in the poorer quarters of some manufacturing towns, there was no water-carriage, the manufacture of manure and of sulphate and muriate of ammonia would become a remunerative enterprise. The event, so far, has borne out General Scott's predictions. Irrigation, or the direct conveyance of the liquid to the land, has been attempted in several localities; and, it is said, sometimes with a fair amount of success. Such success, however, has depended for the most either upon local conditions of soil, or upon enthusiastic individual superintendence; and it has been relieved by a sufficient number of failures to prove that sewage farming is a less simple matter than has been asserted by some of its advocates. It is attended with the further difficulty that the farms are known or suspected to be unpleasant neighbors, and that they would generally diminish the value of surrounding property for residential purposes.

The suggestion made by Sir John Lawes is far too large a one to be treated summarily, and to be either accepted or rejected upon insufficient evidence. It calls for prompt and complete scientific inquiry, such as might be undertaken with adequate assistance by Professor Huxley. In a country like ours, dependent upon others for a large proportion of the daily food of the people, every addition which can be made to our own resources possesses an especial value from the point of view of national independence; and few things could be more important than such an increase of the fish harvest of our coasts as would tend to a much enlarged consumption of fish as food. It is manifest, if we may assume the general proposition of Sir John Lawes to be correct, that the best method of introducing sewage into the sea, whether directly or through the intermediation of an estuary or river, and also the nature and extent of the preparation which it should undergo, would be matters requiring the most careful consideration. It would be necessary to ascertain whether sewage was most valuable for the support of young fry or of larger fish; since in the former case, it should, of course, be discharged into the estuaries which furnish the chief breeding grounds. It might then also be necessary that it should be freed from sludge and road drift by precipitation or other process, inasmuch as finely diffused solid particles are exceedingly hurtful to fish, choking their gills, and killing them by suffocation. It is by this action that some forms of mining industry are so injurious to the rivers, into which the water passing through the works is discharged.

It must be remembered, too, that fish breathe by means of the free oxygen contained in the water in which they live; and it is probable that the water which forms the chief bulk of sewage would be to a great extent deprived of oxygen, this having entered into combination with the various organic constituents. We may assume, therefore, that the quantity of sewage which could be usefully introduced into fish-bearing water would be limited in amount; and that a volume, which when poured into the sea would be highly useful, might nevertheless, if poured into the more limited space of an estuary or a river, be too large in proportion to the mass of water with which it would mingle. It is very probable, even if the present discharge of sewage is doing a good work which was not expected of it, that the conditions under which this work are done might be modified beneficially by the light of inquiry and research. The advantages of the water-carriage system, from the point of view of domestic cleanliness and convenience, are so obvious and manifold that it is not likely to be discontinued, even if it were shown that some different method was to be preferred on other grounds; and hence the achievement of a veritable utilization of sewage, in a manner to imply its complete removal from the vicinity of dwellings, would mark a distinct advance in the great art of dealing profitably with refuse material.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

CONVENT OF THE GOOD SHEPHERD, NEW ORLEANS, LA. MR. JAMES FRERET, ARCHITECT, NEW ORLEANS, LA.

STATUES AND MONUMENTS OF LONDON. — PLATE II.

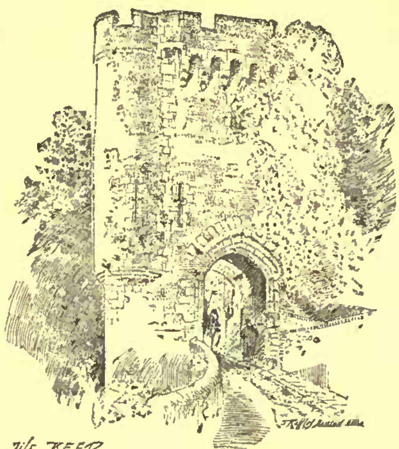
FOR description see article elsewhere in this issue.

PRIZE DESIGNS FOR THE PUBLIC LIBRARY BUILDING, BOSTON, MASS.

THE ADAMS EXPRESS COMPANY'S BUILDING, CHICAGO, ILL. MR. GEORGE H. EDBROOKE, ARCHITECT, CHICAGO, ILL.

DESIGN FOR A HOUSE. MR. ROBERT OYLER, ARCHITECT, SPRINGFIELD, MASS.

THE PETERBOROUGH TOWER CONTROVERSY.



THE KEEP, LEWES CASTLE, ENG.

THE Bishop of Peterborough the other day confessed to an uncomfortable feeling that he might be "exhibited as 'a dreadful example'" on some temperance platforms. The fate the eloquent prelate professed to dread for himself may be said, on other grounds, to be threatening the Chapter of his Cathedral. The difficulties that reverend body involved themselves in when — like the Irishman who killed his pig to save it from dying — they resolved to take down their central tower, the "*magistra turris*" of their noble minster, to prevent it from falling about their ears, may well render them a "dreadful example" to all other Chapters, whom it warns to look well to the stability of the ancient fabrics of which they are the temporary guardians, and if they call in professional advice to be prepared to follow it. "A stitch in time," we all know, "saves nine." It would have required many stitches to have kept up Peterborough tower. Indeed, nothing would have sufficed to save it — *tenui tibicine fultam* — from falling but the complete reconstruction of its four legs. All were unequal to the work they had to do. How unequal was hardly realized till their demolition revealed the badness of their construction; mere shells of ashlar, filled in with rubble, without bond or proper cement. One poor crazy pier only kept its place by being splinted up like a broken limb. The wonder was, as with many Norman towers, how it had stood so long. The practised eye of the late Sir Gilbert Scott, fresh from his colossal works at St. Alban's and St. David's when called in to advise the Dean and Chapter, at once detected the danger. His advice was sharp and decisive. The tower ought to be treated as those we have just named had been. Upheld by timber shores, the arches braced with centreing, one by one the ruinous legs should be taken down and rebuilt in solid masonry, on a deeply-laid and sufficient foundation. There was no difficulty, certainly no risk, about the work. It had been accomplished again and again with perfect safety. One pier had been thus treated by himself at St. Alban's; two piers at St. David's; while at a still earlier date, the late Mr. Cottingham had boldly removed and replaced all four piers at Hereford, without the slightest risk or disturbance of the fabric they supported. But the work would certainly be a costly one, and it was not urgent. There was no immediate fear of the tower falling. So the report was received, discussed, and — shelved. Temporary measures were adopted to stave off any actual danger. Nothing, however, was done to remedy the original evil, and much precious time was lost. Meanwhile the crushing went on. Cracks widened, fissures yawned, new points of weakness were developed, until, some two years since, the condition of the tower become so threatening that it was evident that measures must be taken without delay to avert such a catastrophe as had happened four-and-twenty years before at Chichester. In the meantime the great cathedral restorer of our age had passed away. The architect on whom his mantle had so worthily fallen, Mr. J. L. Pearson, was called in to advise the Chapter. He felt as little doubt as Sir G. G. Scott had done that the lantern could be kept in its position; its shattered walls held together, and its tottering supports one by one rebuilt. If the Chapter resolved on this plan he was

ready at once to carry it out. This, we think, would have been the wisest course. The original work would have been preserved intact, and (which would have been no small gain) the whole of the miserable controversy which has since arisen would have been averted. We should have been spared the letters and replies, statements and counter-statements, hard blows dealt by practised hitters, never careful to spare those who have the misfortune to differ from them, and mutual accusations of bad faith, which certainly do not contribute to the amenities of controversy. There would have been none of the ruffled tempers and irritated feelings which threaten a breach between those who ought to live together as brethren; the Dean and his Committee with Mr. Pearson taking one side, the Canons another, the Bishop — with questionable judgment — supporting the Chapter against their head, and threatening to withdraw his subscription if the course favored by him were not taken; and last, not least, we should not have seen a band of so-called "experts" making confusion worse confounded by the variety of their opinions, and the robust vigor with which some of them have made those opinions known; while one of their number has introduced a new element into the dispute by producing a fresh design of his own, very pretty in itself, but such as certainly never stood, nor, if we may believe an infallible authority, "*se ipso teste*," ever could stand, on the top of Peterborough tower; and finally, to make all things pleasant, Sir Edmund Becket dashing in, in a fine Berserkir rage.

But all this is past praying for. It is no use crying over spilt milk. It was said to be cheaper to pull down than to strengthen and restore. And so the tower is down, and unless the cathedral is to continue in its present half-ruined state, with "maimed rites," bald and undignified, performed in an extemporized choir, fitted up, parish-church fashion, in the eastern bays of the nave, steps must be taken for putting it up again. On this all parties are agreed. But how this is to be done, in what form it is to be rebuilt, on that point the controversy rages. On the merits of this controversy as a question of good faith we have no call to enter. It is not for us to decide whether the terms of the original appeal for subscriptions have been adhered to, and whether the contract will or will not be broken by the adoption of Mr. Pearson's new designs. These waters are too troubled for us to care to fish in. We desire simply to call attention to the fact which is abundantly proved by speeches and letters from Dean Perowne himself, that the original proposal was to reproduce the lantern exactly as it was, without any alteration of its character, either by heightening its base, adding a fresh story, or in any other way. The Dean, in answering a letter of the "Society for the Preservation of Ancient Buildings" — in this case certainly fulfilling their proper mission — "*O si sic omnia!*" — March 1st, 1883, states, "the tower will be *accurately reconstructed stone for stone*" (the italics we are told are the Dean's own), "every stone as taken down will be numbered and replaced." Again, speaking at Northampton on January 20 of the same year, he said (as reported in the *Northampton Herald*) that "they had taken the greatest care in taking down the tower to see that every stone was numbered, so that it might be put back again in exactly the same position as before. . . . and though of course they could not help the tower looking newer than before, yet in every other respect it would not only be exactly the same in appearance, but better in every way."

It may be naturally asked what has caused this change in the Dean's line of action? Why has he thus turned round upon his own original plan? The answer, if we mistake not, lies in the discovery of a large portion of the arcade work of the "*tres hystoriæ*" of the Abbot Waterville's Norman tower, and of the eastern and western lantern arches, used as so much building stone, with the customary contempt shown by early builders for the work of their predecessors, in the new arches and the Decorated lantern. Much of this work is so good and so well preserved that it appeals loudly for restoration to its original situation. The appeal is not an unreasonable one, nor can we be surprised that Mr. Pearson should be ready to listen to it, and that the Dean should follow him in his desire to reproduce the twelfth-century lantern instead of that of the fourteenth. But we feel convinced that, though "the stones cry out of the wall" to be replaced, the cry ought not to be heard. We may reasonably lament the loss of Waterville's tower, especially now that we can see what a beautiful thing it was. But it is gone. For six centuries the eye has been accustomed to the lately demolished lantern tower. To adopt Mr. Freeman's words in his unanswerable letter to the *Times* of January 2, in its late shape, it was "an historical possession," stamping on Peterborough Cathedral "a personality" with which "nothing but the most urgent practical need can justify any interference." The statement has been adopted by our leading journal that the late lantern tower is a thing of the past; and that, as we must of necessity build a new tower, the nineteenth-century builders have as much right to leave their mark on the cathedral as those of the thirteenth had. But this is a mere attempt to throw dust in the eyes of the public. The lantern still exists; disintegrated, it is true, but all but perfect in all its parts. As the Dean has told us, the stones are numbered ready to retake their old places in the walls and windows. In the name of common sense and historical propriety — may we not add, after what we have already quoted from Dean Perowne's letters and speeches? — in the name of good faith and promise keeping, let this unhappy controversy be ended in the only right and sensible way, by the reconstruction of the lantern as it was and as we all have known and loved it. The compromise suggested by the Canons — namely, to carry out Mr. Pearson's design so far as the reconstruction of the lowest story of the lantern, with its internal Norman arcade, thus elevating the lantern about fifteen feet — deserves the fate of all compromises. It is a half-measure, which will satisfy nobody. If the Chapter is to sin, it had better sin boldly, and adopt Mr. Pearson's design *in toto*, spire and all, though we question whether any one now living would see its completion. The reconstruction of the Decorated arches of the lantern follows as a matter of course. The four Norman arches recommended by Mr. Pearson would be noble features, as they are at Durham — if we had them. But we have not got them. And we have two arches which are very far from meriting the contemptuous language in which Mr. Pearson, enamored of his pet project, speaks of them, not now actually *in situ*, but their voussoirs all carefully numbered and stored away capable of being re-erected in a few weeks' time. At St. David's, we have somewhat the same diversity in the lantern arches and the arcades above them. One arch is round, the other three are pointed. If all were round-headed, the effect would be more harmonious. Yet we do not find that Sir G. G. Scott, when restoring that tower, ever suggested any alteration of their form. Neither did he at Ripon, where the plea is far more urgent. For there the semicircular and pointed arches are not opposite to one another, as they are at Peterborough, and while the southern pier of the western arch has been altered and raised, that to the north, together with the semicircular arch above, preserves the unaltered Norman. There are few of our cathedrals and minsters in which we may not find blots we should be glad to remove, omissions which might be made good, mistakes which could be rectified; nay, pieces of downright ugliness to be acknowledged and deplored. The temptation may be great to add the deficient pinnacles to the ponderous lantern tower of York Minster, and to supply a crown like that at Newcastle to the central tower of Durham, and to finish the western towers of Wells with the "tops" they so evidently require. But to do this would destroy the personality of each of these great churches. They might be the more beautiful for the addition, but they would cease to be the great historical monuments they are. For better or worse, in all their main features, we must accept our mediæval buildings as they have come down to us, and be thankful for our unrivalled inheritance. It is not for us to intrude our own fancies upon them, or by destroying features which do not happen to be our taste, and so blotting out whole pages of their architectural history to try to reproduce what they were when they came first from their original architect's hands. Our duty is an humbler and simpler one; to repair the decays of time, to restore the devastation of violence and neglect, and so to hand down the glorious heritage unimpaired to the generation to come. In the preservation of their magnificent western portico, unsurpassed by any Gothic design in Christendom, and the restoration of the ritual choir, with appropriate stall-work and screens, to its old place beneath the re-edified lantern, to say nothing of the underpinning of the transepts, the Dean and Chapter of Peterborough will have enough on their hands for a long time to come, and may well be content with the modest lantern which satisfied their forefathers, and which, however much depreciated by the advocate of a lofty tower, is no mean specimen of Decorated art. — *The Saturday Review.*

COMPETITIONS.

St. Louis, Mo., February 5, 1885.

To the Editors of the American Architect: —

Dear Sirs,—The seductive "Notice to Architects" from the supervisors of Pottawattamie County, Iowa, in the last issue of the *American Architect*, is considered by "Artifex" a "gem of cheek and subterranean ignorance." As this sort of manifesto is neither beautiful nor rare, it fails to meet Webster's definition of a "gem," and as, by the editor's admission, a half-dozen or more responses may be expected from people who call themselves architects, there is small prospect that the supervisors of Pottawattamie County, Iowa, will soon blush at their own ignorance. On the contrary, the publication of their advertisement in the *American Architect*, with addresses and all particulars in full, is more than likely to increase their harvest of plans and thus confirm them in their "cheek."

The usual comment is subjoined that a profession which "does not care to guard itself," etc., from abuse must not expect other people to do it for them. Such admonitions are unquestionably true and appropriate, but no method has yet been suggested of putting them in practice. There always arises the very pertinent as well as impertinent question which William M. Tweed addressed to the citizens of New York, when they grew restive under his swindling management, "What are you going to do about it?"

The architectural profession is not fairly chargeable with indifference to its interests in this matter of competitions. The unfairness, the losses of time and money, the deception, the tricky frauds of every description which almost invariably attend competitions and always have done, and the indignities cast upon the whole profession thereby are well known, keenly felt, sincerely deplored by self-respecting architects everywhere. They exist to-day simply because no one has yet been able to devise a practicable remedy. It is seriously questioned in some quarters whether such a remedy is possible short of the total abolition of competitions.

Numerous schemes have been devised which would work admirably, perhaps, if they could be strictly carried out. Expert judges to make the awards, the names of competitors concealed, the public exhibition of designs, the award of the work at regular commissions

to the successful competitor, the exclusion of all designs which vary from printed instructions, or whose cost will exceed the prescribed limit, a uniform scale and style for all drawings, excluding illusory perspectives — all this, and much more that is equally good and equally useless, because there is no known way of enforcing any of it.

Some years ago the architects of this city prepared a praiseworthy scheme for the conduct of all future competitions, and quite unanimously signed their names to it. It is the writer's confident belief that it was all ignored in the first competition which followed and has never been heard of since. Can any one report much better success with similar efforts anywhere else?

Where on the one side there is a disposition to take advantage of the eagerness of "people calling themselves architects" to offer plans for nothing, and on the other side there are people recognized as architects who are ready to meet such owners and accept their degrading terms, it is vain to hope by any set of resolutions, of whatever kind, to make competitions satisfactory to any but the successful one, or creditable even to him.

As long as there is no recognized standard of training, knowledge and skill in the profession, people "who call themselves architects" may claim that their right to the title is as good as any one's else, and the public cannot be expected to discriminate where architects themselves do not. Could our architectural associations set up a standard of qualification for an architect, and admit none to membership except upon satisfactory examination or other evidence of proficiency, progress would be made in one direction; but this has nowhere been attempted in this country, and is still something of an experiment with the British associations.

Architects may require owners to appoint expert judges, but if they decline to do so who is to compel them? A few architects may refrain from competing, but every one knows there will be a plenty of plans sent in. Moreover, there are a hundred ways of evading this requirement, as of every other. Who shall decide upon the expertness of the expert? In the competition for the St. Louis Exposition Building one expert was a civil engineer, the other was a carpenter and contractor. How shall we make sure that the expert shall be mutually satisfactory to both owners and architects, then how shall we insure that the expert shall not improve his opportunity to his own private advantage? Such things have been charged before now.

Again, it may be required that the owners shall award their work to the author of the successful design at the usual commissions. If the owners decline to do this, what then shall be done? What sort of compulsion is to be brought to bear on them? It has happened more than once that the committee on awards has refused to adopt any of the plans, and then has quietly arranged with the cheapest man to get up a plan according to their instructions, to embody as many as possible of the ideas they have gleaned from the other plans. How is this sort of sharp practice to be prevented?

In whatever direction we turn we are met by these apparently insurmountable difficulties in the enforcement of our regulations. They have always effectually prevented not only all reform, but all amelioration of the evils of competition. There is no real improvement, but rather a deterioration. On what ground can we hope for any different result in the near future?

It is somewhat remarkable that architects alone among the professions are imposed upon in this way. When a man wishes to select a lawyer, he does not send for a dozen attorneys and invite each one to prepare all the documents necessary for his suit, with the expectation that the one whose paper pleases him best will get the job. What sort of answer would the supervisors of Pottawattamie County, Iowa, get from the legal profession if they were to send out a "Notice to Lawyers," such as they have flung to architects? And yet are not young lawyers as eager for employment as young architects?

The medical profession likewise. Conceive a man's sending for a score of physicians to come to his house to look at his tongue, feel his pulse, write out a diagnosis, prognosis, prescription, etc., with itemized bill of costs, and tell them that he will pay for that one which suits him best. The public is entirely too well informed to try such experiments with the medical profession.

Why should not an architect be selected in the same way as a lawyer or a doctor? Where is the necessity for competitions among architects as a condition of employment?

It is doubtless vain, however, to expect that architects, so-called, will decline to compete as long as owners ask them to. It is possible, however, that if the public were properly informed of the delusive results of competitions, there would be less disposition to call for them and thus a reform be instituted in the right quarter. The history of competitions from the owners' standpoints would be very instructive and serviceable in this direction. It would show that in almost every case the plans so selected have failed to meet the expectations of their owners, often with disastrous results, and that such is the natural if not inevitable consequence of this mode of procedure. Such teaching would be to the point and would find much more serious attention from owners than any resolutions which appeared to be solely in the selfish interest of architects. When once they discover the truth that the only safe way is to select their architect as they do their doctor or their lawyer, on the basis of personal qualification, and then consult him throughout the preparation of the design and its execution, a reform will have been initiated in the matter of competitions which will be at least as promising as any effort which has yet been made to control them.

If this should seem to any one a long and tedious undertaking, let him remember for how many years effort has been making in the other direction with no progress at all. Note, also, how completely the public has been aroused within ten years on the subject of sanitary science, to which at the start they were wholly indifferent, and consider that there are now hundreds of architects to every sanitary writer of ten years ago. Show them that the proposed change will be to their own advantage, and they will be quick enough to change their practice. C. E. ILLSLEY.

INCENDIARY STEAM-PIPES.

January 24, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT :—

Dear Sirs, — To what temperature can a steam-pipe be raised by the steam passing through it?

An intensely practical man tells me that wood cannot be ignited by even the closest proximity to steam-pipes in active service, and backs up his assertion by a bet of $10,000, that any fire cannot be traced to this cause.

The same person declares, in regard to tin-covered wooden shutters, that it is necessary to tin only that side of the wood-work that is to be exposed to fire.

In case of a conflagration on the tinned side, would not air work through the cracks, and supply oxygen to the charred wood, creating a blaze, thus destroying the shutter?

The practical man says the tin would melt off before the wood could be sufficiently heated to cause a blaze. What is your opinion?

IGNORAMUS.

[THE temperature of steam, and of the pipe conveying it, increases with the pressure from 212° Fahrenheit at the atmospheric pressure to about 388° at two hundred pounds to the square inch, and in a slightly diminishing ratio for pressures above. The following extract from the *Commercial Advertiser* for February 9, will show the "intensely practical man," that if the bet was actually made he will have to pay. "The recent heavy losses from fire in the lower part of the city was attributed by firemen almost universally to the use of steam as a heating medium, when the hot pipes are not properly protected. The idea that steam-heating pipes cannot set fire to wood is a popular error. One of the best proofs of their danger was afforded about a year ago in the house of Gen. Wager Swayne, in Grammercy Park. Steam-pipes ran through a closet in the basement under the parlor floor, and thence into the library. An alarm of fire was given late one night, and when the firemen tore away the hard-wood partitions they found that the wood-work along which the steam-pipes ran was scorched. The fire had begun in a wooden box into which the steam-pipes entered before forming a coil in the parlor. It was easily got under control, but not before it had done about $10,000 damage. The firemen are inclined to believe that much of their work in the down-town districts is due to nothing else than the lack of protection to steam-pipes." The second question we leave to be answered by the following letter from one much more expert in such matters than ourselves. — EDS. AMERICAN ARCHITECT.]

BOSTON, February 4, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT :—

Dear Sirs, — If your correspondent desires to win the bet offered by the "intensely practical man," whose views have been submitted to me, he can safely take it.

The persistent and obstinate adherence to a mistaken theory of such men as this "intensely practical man," is one of the chief causes of the loss of property by fire, for want of the commonest precautions in the construction and fitting-up of buildings.

It would not be worth while to offer evidence on the subject to such persons, as there are none so stupid as those who *won't* see.

We have in our office a piece of timber from the sill of a hotel which was set on fire by a steam-pipe, carrying steam at twelve pounds pressure, with the pipe adjusted in what remained of the timber just as it was in the building.

We also have an example of oak wood reduced to fine charcoal, ready to break into combustion, whenever circumstances might have favored, and which was formerly a part of a large boiling kier, lined with cement; the cement being held in place by nails whose heads were covered by it. The heat of the boiling water was carried by the iron nails into the oak of the kier, and would have set it on fire ere long had not a change in the method of boiling caused it to be taken to pieces, when its dangerous condition was discovered.

The last fire for which we paid a small sum of money, which was caused by the contact of a steam-pipe with the wood-work, happened in a new addition to an old mill in the process of construction. The steam-pipe had been placed without allowing sufficient room between the end of the service and the wall for the expansion of the pipe. The thrust caused by the heat brought the pipe in contact with the wood-work, and set the mill on fire.

Your "intensely practical man" also shows that he knows nothing about the right method of preparing fire-doors of wood encased in tin. Covering on one side only makes such doors worth no more than an iron door, if as much.

I quote below from third edition of our instructions on this subject.

Very truly yours, E. A.

FIRE DOORS.

"WE find it necessary to repeat the warning against inadequate fire-doors, as we find that reliance still placed on several classes of doors in which we have no confidence, such as rolled or cast iron doors, corrugated or hollow iron doors, wooden doors covered with zinc; a metal which melts at about 700° Fahrenheit, wooden doors covered on only one side with tin.

"The wooden door covered with tin only serves its purpose when the wood is fully encased in tin, put on in such a way that no air, or the minimum of air, can reach the wood when it is exposed to the heat of a fire. Under these conditions, the surface of the wood is converted into charcoal; and charcoal, being a non-conductor of heat, itself tends to retard the further combustion of the wood. But, if air penetrates the tin casing in any measure, the charcoal first made, and then the wood itself, are both consumed, and the door is destroyed. In like manner, if a door is tinned only on one side, as soon as the heat suffices to convert the surface of the wood under the tin and next to the fire into charcoal, the oxygen reaches it from the outside, and the door is of little more value than a thin door of iron or a plain wooden door.

"We submit the following specifications, drawn by Mr. W. B. Whiting, for making a fire-door or shutter that will resist fire longer than any other door or shutter known to us, the construction of the shutter varying from that of the door only in using thinner wood: —

SPECIFICATIONS.

"A door of the right construction to resist fire should be made of good pine, and should be of two or more thicknesses of matched boards nailed across each other, either at right angles or at forty-five degrees. If the doorway be more than seven feet by four feet, it would be better to use three thicknesses of same stuff; in other words, the door should be of a thickness proportioned to its area. Such a door should always be made to shut into a rabbet, or flush with the wall, when practicable: or, if it is a sliding door, then it should be made to shut into or behind a jamb, which would press it up against the wall. The door and its jambs, if of wood, should then be sheathed with tin, the plates being locked at joints and securely nailed under the locking with nails at least one inch long. No air-spaces should be left in a door by panelling or otherwise, as the door will resist best that has the most solid material in it.

"In most places, it is much better to fit the door upon inclined metal slides rather than upon hinges.

"This kind of door may be fitted with automatic appliances, so that it will close of itself when subjected to the heat of a fire; but these appliances do not interfere with the ordinary methods of opening and shutting the door. They only constitute a safeguard against negligence."

A LIST OF BOOKS.

PEORIA, ILL., January 24, 1885.

To the Editors of the American Architect: —

Dear Sirs, — If space permits, give a list of the best books on architecture and building, ventilation and heating, gas-fitting and plumbing, brick and stone masonry, carpentry, and collections of plans for dwellings of moderate cost. (I have those published in your columns.) S.

[Considering our correspondent's position and evident intention, the information he seeks should only be given after a careful consideration, which requires more time than we can at the moment command; for to answer satisfactorily we would have to compile a bibliography of the standard works covering a wide range. We will therefore mention a few of the desirable works only, and trust to answer more at length before long.

Accepting as a condition that only English books are desired, we suggest the following: —

Dictionaries and Encyclopædias. — "*Dictionary of the Architectural Publication Society**;" Gwilt's "*Encyclopædia of Architecture**;" Parker's "*Glossary of Architecture*;" Nicholson's "*Architectural Dictionary.*"

Histories. — Fergusson's "*Handbook of Architecture**;" Viollet-le-Duc's "*Discourses on Architecture.*"

Construction and Materials.—"*Notes on Building Construction**;" Thurston's "*Materials of Engineering*;" Clark's "*Building Superintendence**;" Dobson's "*Art of Building.*"

Carpentry.—Tredgold's "*Carpentry**;" Nicholson's "*Carpenters' and Joiners' Assistant.*"

Limes, Mortars and Cements. — Gillmore's "*Practical Treatise on Limes, Hydraulic Cements and Mortars**;" Reid's "*Portland Cement*;" Vicat's "*On Cement*;" Burnell's "*Limes, Cements and Mortars.**"

Iron.—Fairbairn's "*On the Application of Cast and Wrought Iron to Building*;" Unwin's "*Iron Bridges and Roofs**."

Sanitation.—Latham's "*Sanitary Engineering**;" Gerhard's "*Hints on the Drainage and Sewerage of Dwellings**;" Waring's "*Sanitary Condition of Dwelling-Houses*;" Denton's "*Handbook of Sanitation.*"

Heating and Ventilation. —Peclet's "*Heat and Ventilation**;" Putnam's "*Open Fireplace*;" Billings's "*Ventilation and Heating*;" Box's "*On Heat*;" Galton's "*Healthy Dwellings*;" Baldwin's "*Steam-Heating for Buildings*;" Tomlinson's "*Warming and Ventilation.*"

Drawing.—Ware's "*Modern Perspective**;" Linfoot's "*Architectural Picture-making.*"

Brick and Stone.—Dobson's "*Bricks and Tiles*;" Dobson's "*Masonry and Stone-Cutting*;" Davis's "*Bricks, Tiles and Terra-Cotta.*"

Dwellings. — Comstock's "*American Cottages.*" — Eds. American Architect.]

*Standard and extremely desirable.

CONTINUOUS BRICK KILNS.

OMAHA, NEB., January 20, 1885.

To the Editors of the American Architect: —

Dear Sirs, — I am anxious to learn if any *continuous brick kiln*, so well received all over Europe, and in use there since about 1864, has ever been employed in the United States, and if so; *how* approved of by our brick manufacturers.

Any information concerning this subject, or addresses of men using these said kilns, you may be able to give, will be thankfully accepted.

Hoping to have the pleasure to hear from you at your earliest convenience. I remain, yours respectfully, H. Rohwer.

[We believe you will find the information you seek in the *Scientific American Supplement*, Nos. 160 and 186. — Eds. American Architect.]

COMBUSTIBLE CHURCHES.

February 9, 1885.

To the Editors of the American Architect: —

Dear Sirs, — When I called for plans and specifications of the interior construction of a church of which you lately gave an interesting design, my purpose was to determine whether or not when constructed it would be a stone screen protecting an inside cellular wooden structure from water, in case a fire should occur in the customary way by which churches are now being consumed at the rate of about one-and-a-half per week in this country.

To this, R. B., Jr., responds that I inquire for plans "for *fire-proof* schools and churches, and that it is easier to make such plans than to get the public to pay the extra cost."

I made no such inquiry. I only wish to see some plans of churches in which the same materials now used in making the excellent examples of combustible architecture may be otherwise disposed in such a way that a prudent underwriter might bet that they would *not* be completely destroyed by a small fire starting in the cellar, at as low a rate as it would generally be safe to bet that they *will* be utterly ruined from the smallest spark of fire dropped anywhere. E. A.

NOTES AND CLIPPINGS.

A Singular Cause of Fire. — A small fire recently, in the St. Andrew's tenement, in a suburb of Boston, was caused in the following remarkable manner: An unusually hot fire in a patent parlor grate stove melted the solder securing the end piece of the ornamental brass rod which extends over the stove door. The piece immediately dropped off and the resin with which the rod was filled to prevent its denting ignited, ran out and set fire to the rug and curtains. Fortunately, the tenants were in the room at the time and extinguished the flames before any serious damage was done. Had it been in the dead of night, the result would undoubtedly have been a heavy loss of life and property. When there is so much fireproof material with which such rods could be filled, it must be due to intense stupidity that such an incendiary article as resin should be used. — *The Weekly Underwriter.*

A Sanitary Canal for Paris. —A project for a sanitary canal between Paris and the sea has been brought before the French Academy of Sciences by M. A. Dumont. The author points out that although the experiments of the City of Paris engineers at Gennevilliers appear to show that irrigation is the best means of disposing of the drainage of Paris, it is very doubtful if the space available at the forest of St. Germain is sufficient for the purpose, the drainage waters of Paris amounting to over 100,000,000 cubic metres per annum. Hence his idea of a canal to the sea to carry off the daily accumulation of 300,000 cubic metres of sewage. The starting-point of the proposed canal would be a covered reservoir at Herblay on the right bank of the Seine. From Herblay to a point on the coast between Dieppe and Tréport the canal would be 152 kilometres long, and covered throughout. The route of this canal would be by Eragny (crossing the Oise by a viaduct 25 metres high), thence to Serifontaine, Neufchâtel, St. Martin, and Grèges, to the Channel at a point 7 kilometres from Dieppe, and 17 kilometres from Tréport, where the current and trend of the coast would prevent any nuisance to these ports. Pumping would be resorted to at some points; but at the outfall, motive power could be obtained from the waters. A more important point in connection with the new scheme is that it would admit of the water being utilized for irrigation purposes *en route*, and during two-thirds of the year probably all the sewage would be thus disposed of. The estimated cost of the canal is sixty millions, and the expense of pumping would be largely covered by the sale of the waters along the track of the canal. The section of the latter would permit the flow of at least 500,000 cubic metres per diem. The scheme is well worthy the consideration of other crowded centres, since it unites the utilization of the sewage at separate districts along a considerable length of country, together with the advantages of a covered drain. It is, in fact, virtually a means of distributing sewage waters for irrigation purposes. For Paris the work would be highly beneficial on the score of health.—*Engineering.*

Slate Debris and its Utilization. — An ordinary meeting of the Civil and Mechanical Engineers' Society was held on Wednesday evening, the seventeenth of December, the President, Mr. Thomas Cole, A. M. I. C. E., in the chair, when a paper, illustrated with experiments, was delivered by Dr. G. Selkirk Jones, F. C. S., upon "Slate Débris and its Utilization." The author, after describing the composition and geological formation of clay slate, called attention to the various substances which in the laboratory he had obtained from waste slate, or débris, such as crystallized alum, so much in demand as a mordant in calico-printing and other processes; secondly, a new filtering agent for sugar refining and water purification, this substance containing a large percentage of carbon; thirdly, a substance which he named "Argifline," to be used in conjunction with lime for the chemical precipitation of lime. The author then showed an aluminate of peculiar composition, possessing good detergent properties, and which, he said, had already found much favor among wool and silk scourers, its efficacy as a detergent being due, firstly, to its powers as a remover of grease, etc. and, secondly, on account of its harmless action upon those delicate fabrics, the curl of the wool being uninjured, and the silk freed from the so-called gum without damaging the fibre. The slate débris was next shown in its prepared condition for the manufacture of French chalk, pigments, fullers' earth, earthenware, cement, and concrete. Another feature of slate débris utilization was also pointed out, viz., the manufacture of good and substantial bricks, sanitary and other tubes, tiles, etc. The author showed by experiment the cleansing of dirty wool, selecting the worst specimen he could obtain. He also precipitated the solid matter from a gallon of very offensive sewage-water, leaving the effluent bright and comparatively pure. In speaking upon the question of sewage purification, and of our possible visitor, the cholera, the author remarked that this was not a question so much of cost as of national importance. From a sanitary and hygienic point of view, what, he argued, was £5,000 or even £10,000 a year outlay compared with the incalculable advantages of pure drinking-water and the prevention of zymotic diseases among the community? The exclusive rights in respect to the foregoing have been secured at home and abroad? — *The Builder.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

BUILDING PATENTS.

[*Printed specifications of any patents herementioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.*]

311,487. VISE. — Thomas G. Hall, Brooklyn, N. Y.
311,489. ELEVATOR. — Charles W. Hays, Orange, N. J.
311,502. HOT-AIR FURNACE. — Abram Mann, Kansas City, Mo.
311,504. ELEVATOR. — Volney W. Mason, Providence, R. I.
311,509. FRESCO-WORK. — Ettore S. Miragoli, St. Louis, Mo.
311,510. AWNING FOR WINDOWS. — Matthew Moneyment, Philadelphia, Pa.
311,518. STRAP-HINGE.—Bartlett D. Palmer, What Cheer, Io.
311,557. DRYING APPARATUS FOR BRICK AND TILE KILNS.—Chester L. Ames, Cabery, Ill.
311,567. DEAFENING OR FILLING FOR WALLS.—Leonard E. Clawdon, San Francisco, Cal.
311,569. COMPOSITE ROOFING. — William Coultas, Stockton-on-Tees, County of Durham, Eng.
311,575. REVERSIBLE LATCH. — Daniel H. Fitzgerald, Reading, Pa.
311,578. SCAFFOLDING.—John T. Haskell, Norwalk, Ohio.
311,587. APPARATUS FOR FLUSHING THE BOWLS OF WATER-CLOSETS. — Thomas Keyworth, Brooklyn, N. Y.
311,599. VALVE MECHANISM FOR WATER-CLOSET CISTERNS.—George R. Moore, Philadelphia, Pa.
311,604. DOOR-CHECK.—Levi Pentz, Canton, O.
311,606. STEAM-SUPPLY SYSTEM. — Nathaniel W. Pratt, Brooklyn, N. Y.
311,608. FLOORING-CLAMP.—Alonzo Redman, Chicopee, Mass.
311,637. LATCH AND LOCK COMBINED. — Frederick J. Biggs, London, Eng.
311,649. AUTOMATIC SAFETY-BRAKE FOR ELEVATORS AND HOISTS. — Dominique Crespin de la Jeanniere, Paris, France.
311,656. APPARATUS FOR LAYING SUBMARINE TUNNELS AND TUBES. — Hayden H. Hall, New Hamburg, N. Y.
311,660. TILE-KILN. — Gregory Jennings, West Cairo, O.
311,661. FIRE-ESCAPE. — Charles W. Joynt, Makanda, Ill.
311,666. LATH. — James Morrison, Jr., New York, N. Y.
311,669. FIRE-ESCAPE.—Robert H. Nichols, Aylesford, Nova Scotia, Can.
311,674. ASH-CHUTE. — Henry Pashley, Brooklyn, N. Y.
311,676. ROOFING-BRACKET.—Edwin Prescott, Arlington, Mass.
311,677. CONSTRUCTION OF BUILDINGS.—Elisha L. Randall, Durand, Wis.
311,684. ELEVATOR-HATCHWAY COVER. — William H. Skerritt, Jersey City, N. J.
311,694. APPARATUS FOR THE MANUFACTURE OF ARTIFICIAL STONE. — C. Irvine Walker, Charleston, S. C.
311,697. DOOR-HANGER.—Warren E. Warner, Syracuse, N. Y.
311,729. ASBESTOS PACKING. — John Dewrance, Lambeth, County of Surrey, Eng.
311,741. MACHINE FOR SAWING STONE. — Paulin Gay, Paris, France.
311,742. PNEUMATIC DOOR-CHECK.— Willim Gilfillan, New Haven, Conn.
311,752. FIRE-HOSE CASE OR BOX. — John T. Hawkins, Taunton, Mass.
311,753. DOOR-KNOB ATTACHMENT. — Nathan Hawkes, Appleton, Me.
311,760. LOCKING DEVICE FOR SLIDING DOORS.—David Hoke, Altoona, Pa.
311,765. WINDOW-FASTENER. — George H. Kanmacher, Columbus, O.
311,783. ELEVATOR. — William F. Rau and Conrad Münch, Cincinnati, O.
311,784. SKYLIGHT.—Richard H. Reillé, New York, N. Y.
311,800. CALIPERS.—Charles H. Alapaw, St. Louis, Mo.
311,805. FIRE-ESCAPE. — Joseph H. Bowley, Marengo, Ill.
311,825. WEATHER-STRIP. — Solomon Funk, Spirit Lake, Io.
311,827. WINDOW-SCREEN. — Jay R. Graver, Lincoln, Neb.
311,836. DOOR STOP AND HOLDER.—Sidney W. Jay and Michael J. Garvey, Toledo, O.
311,845. HOT-AIR FURNACE. — Thos. Nugget, New York, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

WAREHOUSE. — Chas. L. Carson, architect, has prepared plans for Solomon Frank, Esq., for a five-st'y brick and stone warehouse, 28' x 91', to be erected on West Baltimore St., near Eutaw St., and to cost, $30,000; S. H. & J. F. Adams, contractors.

DWELLINGS.—Geo. S. Brown, Esq., is to have built 17 three-st'y brick and Cheat River stone dwells., 16' x 45', and to cost, $3,500 each; com. cor. Harlem and Fulton Aves.; and 13 three-st'y brick dwells., 12' x 30', and to cost, $1,000; near alley in rear of above; from designs by Frank E. Davis, architect, Jackson Holland, builder.

BUILDING PERMITS. — Since our last report sixteen permits have been granted, the more important of which are the following: —

S. D. Price, 7 three-st'y brick buildings, n e cor. Chase and Barclay Sts.; and 5 three-st'y brick buildings, s s Chase St., w of McKim St.

J. M. Getz, 14 two-st'y brick buildings, w s Ensor St., bet. Biddle and Chase Sts.; and 6 two-st'y brick buildings, com. n w cor. Chase and Ensor St.

John E. Phillips, five-st'y brick warehouse, n s Pratt St., bet. Howard and Eutaw Sts.

J. E. Emerson, three-st'y brick building (square), n w cor. Gilmor St. and Lafayette Ave.

N. M. Rittenhouse, one-st'y brick building 40' x 60', s w cor. Covington St. and Fifth Lane.

George Zeller, three-st'y brick building, n w cor. Jefferson and Chapel Sts.

Mary A. Parks, 10 two-st'y brick buildings, s s Nanticoke St., w of Cross St.

Brooklyn.

BUILDING PERMITS.—*Greenpoint Ave.*, s s, 72' w Manhattan Ave., one-st'y frame skating-rink, with gallery on one side, felt roof; cost, $7,500; owners, R. Hall Benton and Eugene Fisher; architects and builders, Randall & Miller.

Scholes St., s s, 100' w Graham Ave., two-st'y brick stable and one-st'y brick engine-house; cost, $5,000; owner, Henry Kiefer; architect, J. Platte; builder, J. Rueger.

Rutledge St., s s, 100' w Harrison Ave., 4 three-st'y brick flats, tin roofs, wooden cornices; cost, each, $7,000; owners and builders, Jacob Bossert and John Auer, Heyward St., near Harrison Ave ; architect, J. Platte.

North Twelfth St., at foot of street, two-st'y brick packing-box factory, tin roof, brick cornice; cost, $15,000; owner, Pratt M'f'g Co., on premises; architect, F. L. R. Swift; builder, not selected.

Fulton St., s e cor. Lafayette Ave., 5 four-st'y iron stores and tenements, tin roofs, cost, $50,000; owner, A. S. Robbins, 114 Sixth Ave.; architect and carpenter, Joseph Platt; masons, J. De Mott & Sons.

MacDougal St., n e cor. Ralph Ave., 2 three-st'y brick stores and dwells., tin roofs; cost, total, $14,000; owner, Edw. F. Holtz, on premises; architect, Th. Engelhardt; builders, A. Sutterline and P. Kunzweiler.

Central Ave., *Nos.* 71 *and* 73, cor. Melrose St., 2 three-st'y frame stores and dwells., tin roofs; cost, total, $9,000; owner, Leonhard Eppig, 58 Central Ave.; architect, Th. Engelhardt.

Halsey St., n s, 125' e Reid Ave., 3 two-st'y brick dwells., tin roofs, wooden cornices; cost, each, $3,000; owners, Frederick and John Dhuy, 184 Chauncey St.; carpenter, John Dhuy.

Chicago.

BUILDING PERMITS. — J. Schlage, 2 two-st'y flats, 49-51 North May St.; cost, $7,000; architect and builder, S. M. Walden.

E. Batcheller, five-st'y factory, 42-44 West Monroe St.; cost, $35,000; architect, L. D. Cleveland; builder, N. Barton.

J. O. Boyle, two-st'y stable, 220-222 Illinois St.; cost, $3,000.

J. H. Cummings, two-st'y dwell., 515 Dearborn Ave. cost, $4,000.

F. R. Goss, two-st'y store and flats, 1115-1121 Harrison St.; cost, $6,000; architect, S. N. Philpot.

G. N. Hull, 2 two-st'y stores and flats, 337-339 South Western Ave.; cost, $5,000; architect, A. S. Sprague.

Geo. Heppish, 8 three-st'y dwells., 111-125 Sibley St.: cost, $30,000; architect and builder, Geo. Heppish.

Geo. Heppish, three-st'y store and flats, 517 Taylor St.; cost, $6,000.

C. A. Brecht, two-st'y dwell., 597 Chicago Ave.; cost, $4,000.

H. Schwinkendorf, three-st'y flats, 177 Tremont St.; cost, $4,000; architect, T. Reinhardt.

J. Enerson, three-st'y flats, 286 West Erie St.; cost, $4,000; builders, T. Tobiason & Co.

W. J. Anderson, 3 cottages, 480-486 Armitage St.; cost, $2,700.

W. C. Houston, two-st'y dwell., Belleview Ave.; cost, $3,500.

B. C. Chambers, 2 additional stories, 153-157 Dearborn St.; cost, $20,000; builder, E. Sturtevant.

J. Henry, three-st'y flats, 133 California Ave.; cost, $5,000; architect and builder, J. Henry.

Mrs. M. Irving, three-st'y flats, 247 Thirty-seventh St.: cost, $5,000; architect, Geo. McDonald.

A. Mueller, two-st'y store and dwell., 287 Clybourne Ave.; cost, $3,000.

Mrs. M. E. Sands, two-st'y dwells., 491-503 West Jackson St.; cost, $40,000.

G. D. Pease, three-st'y store and flats, 993 West Van Buren St.; cost, $4,500; architect, A. Smith; builder, A. Dressel.

New York.

First-class builders have their pencils finely pointed, for hardly any work is yet on the market. Speculative builders and owners of cheap tenements keep up the volume of projected buildings.

APARTMENT-HOUSE. — On the n e cor. of Lexington Ave. and Seventy-second St., a six-st'y apartment-house, 45' x 98', is to be built at a cost of $100,000, from plans of Mr. Selig Steinhardt,

HOSPITAL.—It is proposed to have an additional story built on the building of the Mount Sinai Hospital, on Lexington Ave. and Sixty-sixth St.

BUILDING PERMITS. — *East Ninth St.*, *Nos.* 206 *and* 208, five-st'y brick and terra-cotta dwell., tin roof; cost, $32,000; owner, James Thompson, per E. R. Robinson, 150 Broadway; architect, G. B. Post.

Rivington St., n w cor. Norfolk St., 2 five-st'y brick tenements, tin roofs; total cost, $38,000; owner, Francis Keckeissen, 307 Fifth St.; architect, J. Kastner.

Norfolk St., *No.* 115, four-st'y brick stable, etc., tin roof; cost, $12,000; owner and architect, same as last.

Sixty-fourth St., n s, 175' w Eleventh Ave., two-st'y brick factory, tin roof; cost, $12,000; owner, Henry Raabe, 235 West Fifty-third St.; architect, J. Brandt.

Allen St., *No.* 7, five-st'y brick tenement, tin roof, cost, $21,000; owner, Chas. Pfeiff, 17 Eldridge St.; architect, W. Graul.

One Hundred and Fortieth St., s s, 77' e Willis Ave., three-st'y brick dwell., tin roof; cost, $5,500; owner, A. F. Nickel, 298 Willis Ave.; architects, Ebeling & Hennricke.

Madison Ave., e s, 350' n One Hundred and Seventy-ninth St., three-st'y frame dwell., tin roof; cost, $4,300; owner, Margaret L. Haughey, 1436 Lexington Ave.; architect and builder, Robert H. Taylor.

Melrose Ave., s e cor. One Hundred and Fifty-fifth St., three-st'y frame dwell., tin roof; cost, $4,500; owner, Wm. Conrad, 611 East One Hundred and Fifty-fifth St.; architect, Chas. Volz; builder, Wm. Kusche.

Sixty-fifth St., n s, 250' w Eighth Ave., 5 five-st'y brick flats, tin roofs; cost, each, $30,000; owner, Jas. Philp, Fifty-first St. and Broadway; architects, Thorn & Wilson.

Stanton St., *No.* 233, five-st'y brick tenement and store, tin roof; cost, $15,000; owner, Frank A. Seitz, 315 East Forty-second St.; architect, Jos. M. Dunn.

West Thirty-fifth St., *No.* 256, five-st'y brick tenement, tin roof; cost, $16,000; owner, Lawrence Curnan, 260 West Thirty-ninth St.; architect, Jos. M. Dunn.

Morris Ave., n w cor. One Hundred and Forty-ninth St., 4 four-st'y brick tenements and stores, tin roofs; owner, Mrs. Margaret A. Johnson, 2200 First Ave.; architect, Andrew Spence.

Fifth Ave., *No.* 793, two-st'y brick store and green-house in rear; cost, $4,000; lessees, Sarah I. Burnham and W. W. Hall, 245 West One Hundred and Twenty-ninth St.; architect, C. Abbott French.

First Ave., w s, 75' s Twenty-third St., four-st'y brick workshop, tin roof; cost, $4,000; owner, John Kreeb, 471 First Ave.; architects, Thom & Wilson.

Tenth Ave., 10' s cor. Fifty-first St., five-st'y brick tenements and stores, tin roofs; cost, $15,000; owner, Thurlow W. Coulter, 751 Tenth Ave.; architects, A. B. Ogden & Co.

One Hundred and Fourth St., s s, 80' w Third Ave., five-st'y brick flat, tin roof; cost, $22,000; owner, Mary E. Bailey, 186 East One Hundred and Fourth St.; architect, Chas. Baxter; carpenter, —— Baxter, 108 East One Hundred and Twenty-fifth St.

Bergen Ave., s w cor. Rose St., 2 three-st'y frame tenements, and a two-st'y frame stable on rear of lot, tin roofs; cost, total, $12,000; owner, Henry Ahr, 681 North Third Ave.; architect, Theo. E. Thompson.

Ninth Ave., n e cor. Forty-fifth St., 4 five-st'y brick tenements and stores, tin roofs; cost, three $18,000 each, and one $26,000; owner, Wm. Rankin, 332 West Forty-seventh St.; architect, E. Louis Ungrich.

Second Ave., e s, 100' n Sixty-third St., five-st'y brick workshop, gravel roof; cost, $17,000; owner and builder, Geo. B. Christman, 331 East Fifty-fifth St.; architect, Wm. Graul.

Norfolk St., *Nos.* 72-76, 3 five-st'y brick tenements, tin roofs; cost, each, $21,000; owners, H. & S. J. Silberman, 79 Canal St.; architect, Wm. Graul.

Pier, foot of East Twenty-third St., frame and iron ferry-house, slate and tin roof; cost, $25,000; owner, People's Ferry Co., by Jos. J. O'Donohue, 44 West Fifty-fourth St.

Walton Ave., w s, 250' n One Hundred and Fiftieth St., two-st'y frame dwell., tin roof; cost, $4,000; owners, Stephen F. Stafford and wife, 605 Walton Ave.; builder, Stephen F. Stafford.

Ninety-fifth St., s s, 199' 8" and 224' w Ninth Ave., 2 three-st'y brick dwells., slate roofs; cost, each, $6,000; owners, Edwin and Chas. Fraser, 13 St. Luke's Pl.; architect and carpenter, Louis Falk; mason, James McGarity.

ALTERATIONS. — *Gold St.*, *No.* 36, repair damage by fire; cost, $3,500; owner, W. E. Dodge, 262 Madison Ave., and D. W. James, Park Ave. and Thirty-ninth St.; architect and builder, E. Smith.

Allen St., *No.* 5, add one st'y; cost, $3,000; owner, Charles Pfeiff, 17 Eldridge St.; architect, W. Graul.

West Twelfth St., *Nos.* 351 *and* 353, replace second and third floors, also repair brick walls; cost, $4,000; owner, Peter C. Ritchie, exr., 351 West Twelfth St.; builder, John L. Hamilton.

Eighth Ave., *Nos.* 512 *and* 514, new store-fronts; cost, $3,500; owner, Courtland Palmer, Trustee, 117 East Twenty-first St.; builder, A. Gibbins.

West Fifteenth St., *No.* 318, three-st'y brick extension, tin roof; cost, $3,500; owner, Leopold Aman, on premises; architect, John J. Tucker; builder, Wm. A. Vanauhoff.

Second Ave., e s, Ninety-sixth to Ninety-seventh St., three-st'y brick extension on rear, gravel roof; cost, $75,000; owner, Second Ave. R. R. Co., on premises; architect, John G. Prague.

Broadway, s e cor. Liberty St., internal alterations, such as new stairs, two passenger-elevators, new boilers, new plumbing, etc., fix up for offices; cost, $50,000; owner, Mutual Life Ins. Co., Nassau; Cedar and Liberty Sts.

Philadelphia.

FACTORY. — At Tenth St., cor. Filbert St.; Kisler & Oram, contractors, will erect from plans drawn by Collins and Autenreit & Co., architects; six-st'y building for manufacturing purposes, 70' x 100', the material used will be bricks, Richmond granite and ornamental terra-cotta, the Tenth St. front will be of glass, and so arranged in the first st'y as to make 3 stores if necessary; there will also be a boiler-house, two-st'y, 20' x 60', located in rear on Rementer St.

BUILDING PERMITS.—*Christian St.*, *No.* 1503, two-st'y shop, 18' x 29'; Thos. Smith, owner.

North St., w of Seventy-first St., three-st'y dwell.; M. Boyle, contractor.

Oxford St., *No.* 2514, addition to stable, 46' x 51'; Harry A. Bears, owner.

Weikel St., n w cor. of Ontario St., three-st'y dwell., 16' x 45'; L. Schwab, contractor.

Kensington Ave., n w cor. Cumberland St., one-st'y skating-rink, 40' x 80'; C. I. Schroeder, owner.

Rover St., above Indiana Ave., two-st'y dwell., 16' x 27'; Dickson & Bro., contractors.

Norris St., e of Sepovia St., addition to building, 15' x 34'; Wm. H. Grisler, contractor.

North Ninth St., No. 41, back building, 16' x 36'; Rea & Riley, contractors.

St. Louis.

BUILDING PERMITS.—Thirty-seven permits have been issued since our last report seven of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

Emma Lingenfelder, 3 adjacent two-st'y tenements; cost, $11,000; M. Frederici, builder.

F. Reinor, two-st'y store and dwell.; cost, $3,300; H. Ellermann, builder.

Chas. Kurz, 4 adjacent two-st'y tenements; cost, $6,500; Thos. Gugerty, builder.

Thorn & Fullertin, 3 adjacent two-st'y dwells.; cost, $7,000; B. Weber & Co., builders.

Mrs. S. Doyle, 3 adjacent two-st'y dwells.; cost, $8,000; I. S. Taylor, architect; Jno. McMahon, builder.

Globe Panorama Co., one-st'y brick panorama; cost, $45,000. I. S. Taylor, architect; Goesse & Remmers, builders.

Henry Hitchcock, two-st'y store and dwell.; cost, $3,000; sub-let.

Wm. J. Nolker, 3 adjacent two-st'y dwells.; cost, $11,000; E. Jungenfeld, architect; Bothe & Rattermann, builders.

Wm. J. Nolker, 2 adjacent two-st'y dwells.; cost, $7,000; E. Jungenfeld, architect; Bothe & Rattermann, builders.

Joseph Specht, two-st'y brick dwell.; cost, $35,000; Bothe & Rattermann, builders.

Joseph Specht, two-st'y stable, cost, $4,000; Bothe & Rattermann, builders.

Gerst M'f'g Co., two-st'y brick factory; cost, $3,000; Bothe & Rattermann, builders.

Wm. Seaver, two-st'y brick restaurant; cost, $4,000; A. Beinke & Co., architects; C. H. Poertner, builder.

Henry Tielkemeyer, 2 adjacent two-st'y tenements; cost, $3,200; A. Beinke & Co., architects; sub-let.

Mrs. B. Roth, 2 adjacent two-st'y tenements; cost, $4,000; E. W. Black, builder.

A. Vosse, two-st'y tenement; cost, $3,000; A. Vosse, builder.

Mrs. W. Smith, 3 adjacent two-st'y dwell and tenements; cost, $3,000; B. Smith, builder.

Washington, D. C.

BUILDING PERMITS.—Since last reports the following have been issued: —

O St., between Twentieth and Twenty first Sts., n w, 2 three-st'y brick dwells., for Glenn Brown, owner and architect; cost, $9,000.

E St., between Sixth and Seventh Sts., n w, one-st'y brick skating-rink, 74' x 159'; cost, $10,000; E. C. Gilbert, owner.

K St., between Twenty-sixth St. and Twenty-seventh St., n w, 3 three-st'y brick dwells., for C. Henrich; cost, $7,000; C. A. Didden, architect.

Fourth St., between E and F Sts., n w, three-st'y brick dwell., for Mrs. I. Johnson; cost, $5,000; Lewis Stutz, architect.

Thirteenth St., between M and N Sts., n w, 3 three-st'y brick dwells., for Robert Portner; cost, $14,000; C. A. Didden, architect.

Eighth St., between S and T Sts., n w, two-st'y brick dwell., for R. L. Parry; cost, $3,800.

Nineteenth St., between Q and R Sts., n w, three-st'y brick dwell., for W. T. Okie; cost, $8,000; C. C. Martin, architect and builder.

Massachusetts Ave., s s, between Twenty-first and Twenty-second Sts., n w, dwell., 52' x 61', four-st'y and basement, for Mrs. Anastasia Patten, of California; cost, $90,000; Col. R. I. Fleming, architect and builder.

General Notes.

BEATRICE, NEB. — Bank and office-building for Thos. Yule; cost, $10,000; Ellis & Turner, architects, Marshalltown, Iowa.

ELLSWORTH, ME.—The people of Hancock County are to vote in March on the question of erecting a new jail, a court-house, and a registry of deeds. It is believed that the expenditure of $30,000 or $40,000 will so remodel the present structures that they will meet the needs of the county, and this course will probably be adopted.

LOCKPORT, N. Y. — About 500 persons, representing different towns in Niagara County, crowded the court-house February 7, and protested against the passage of a bill, now in the State Senate, authorizing the building of a new court-house and city-hall in Lockport.

LOS ANGELES, CAL. — California will build a State Insane Asylum at Los Angeles.

NATICK, MASS. — Takawambeit Lodge, I. O. O. F., is draughting plans for a large brick structure, to be built on its lately purchased site on South Main St.

PEORIA, ILL. — House for W. G. Sloan; cost, $20,000; Ellis & Turner, architects, Marshalltown, Iowa.

RAYMOND, N. H. — The town of Raymond has appropriated $3,500 for the erection of a building to be occupied as a shoe factory by F. M. Hoyt.

RED OAK, IOWA.—High-school building; cost, $15,000; Ellis & Turner, architects, Marshalltown, Iowa.

Also, Ward school-house; cost, $10,000.

SOUTH ORANGE, N. J. — Miss Caldwell's gift toward the establishment of a Catholic university has been increased, and it is said that arrangements have been completed for a new and magnificent institution, to be located within fifteen or twenty miles of New York. It is said that the site of Seton Hall College, South Orange, will be selected on account of its admirable location and its accessibility.

SWEETWATER, EAST TENN. — We are expecting to build a new church within two years. James A. Wallace, Pastor Pres. Church.

Bids and Contracts.

BROOKLYN, N. Y.—The lowest bid for concreting the foundation of the new Federal Building is for $5,471, made by John Cox, of Chicago. Of the eight other bids, the highest was for $15,937.

BUFFALO, N. Y.—The following is a synopsis of the bids for marble wainscoting and mantels at the custom-house: —

Burlington Manufacturing Company, Chicago, Ill., $10,288.

Davidson & Sons, Chicago, Ill., and Milwaukee, Wis., $9,416.

Lautz & Co., 861 Main St., Buffalo, N. Y., $12,627.84.

Pickel Stone and Marble Company, St. Louis, Mo., $11,107.

Charles E. Hall & Co., 69 Charlestown St., Boston, Mass., $13,457.

E. Fritsch, 515 West Twentieth St., New York, $8,538.

R. C. Fisher, New York City, $14,581.54.

CINCINNATI, O. — The following were the bids on the carpenter-work of the new court-house:—

James Gurren, $50,000; H. E. Holtzinger, $46,336; Henry Behrens, $45,265; Harwood & Son, $40,628; J. F. Nieber, $39,475; Robert Thoms, $58,900; Griffith & Son, $35,980; Jos. Cotteral & Co., $28,937.50.

KANSAS CITY, MO. — The following is a synopsis of the bids for marble wainscoting and mantels for the custom-house: —

Burlington Manufacturing Company, Michigan Ave. and Van Buren St., Chicago, Ill., $16,608.

Davidson & Sons, North Market St., Chicago, Ill., $16,484.

Pickel Stone and Marble Company, 1851 Broadway Street, St. Louis, Mo., $14,940.

E. Fritsch, New York City, $17,426.75.

R. C. Fisher, New York City, $17,896.60.

Vermont Marble Company, Centre Rutland, Vt., $16,113.75.

MEMPHIS, TENN.—The following is a synopsis of the bids for marble wainscoting and mantels for the custom-house: —

Burlington Manufacturing Company, Chicago, Ill., $5,783.

Davidson & Sons, Chicago and Milwaukee, $6,156.

Pickel Stone and Marble Company, St. Louis, Mo., $6,370.

E. Fritsch, New York City, $6,734.

R. C. Fisher, New York City, $6,305.

PEORIA, ILL.—The following is a synopsis of the bids for marble wainscoting, mantels and floor-tiling for court-house: —

King & Bull, Peoria, Ill., $14,034.37½.

Burlington Manufacturing Company, Chicago, Ill., $11,455.

Davidson & Sons, Chicago and Milwaukee, $10,906.

Peoria Steam Marble Works, Peoria, Ill., $10,244.99.

Pickel Stone and Marble Company, St. Louis, Mo., $11,758.

E. Fritsch, New York City, $9,190.

R. C. Fisher, New York City, $11,012.

TOLEDO, O.—The following is a synopsis of the bids for marble wainscoting, mantels and floor tiling: —

Burlington Manufacturing Company, Chicago, Ill., $15,939.

Davidson & Sons, Chicago and Milwaukee, $16,899.

Lautz & Co., Buffalo, N. Y., $18,932.91.

Pickel Stone and Marble Company, St. Louis, Mo., $17,067.

R. C. Fisher, 97 East Houston St., New York, $18,061.85.

Vermont Marble Company, Centre Rutland, Vt., $13,267.

PROPOSALS.

SEA-WALL.

[At New York, N. Y.]

Sealed proposals will be received at the Office of the Department of Health, No. 301 Mott St., **until February 17, 1885**, for extension of sea-wall on North Brother Island. For full information see *City Record*, for sale at No. 2, City Hall. 477

WATER-CLOSET APPARATUS FOR PUBLIC BUILDINGS.

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., February 10, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 3d day of March, 1885**, for furnishing and delivering properly boxed, free on board cars, water-closet apparatus, that may be required for public buildings during the balance of the present and the next fiscal year ending June 30, 1886, in accordance with specification, copies of which and any additional information may be had at this office.

Bids must be accompanied by a certified check, for $500, and those received after the time of opening will not be considered. M. E. BELL,

479 Supervising Architect.

COURT-HOUSE ALTERATIONS.

[At Preston, Minn.]

PRESTON, January 9, 1885.

The County Commissioners of the County of Fillmore, in the State of Minnesota, will receive sealed proposals **until the 25th day of March, 1885, at 12 o'clock, M.**, at the office of the county auditor, in the village of Preston, said county, for the remodeling of the county court-house in said village, and the building of 2 two-st'y brick additions thereto, and iron vaults therein, and the furnishing all materials, in accordance with the plans and specifications therefor on file in the office of said auditor, which can also be seen at the office of Mayberry & Son, architects, Winona, Minnesota.

No bids will be received except for the whole building complete as specified.

The successful bidder will be required to give a sufficient bond with sureties, within a reasonable time to be fixed by said commissioners, in the sum of $15,000, to be approved by said commissioners, conditioned upon the faithful performance of his contract.

Each bid must be accompanied by a sufficient bond with sureties, or a duly certified check payable to said county in a sum of at least five per cent of such bid, conditioned upon the giving the bond above specified within the time so fixed, provided such bid should be accepted. The work will cost several thousand dollars, and must be completed on or before the first day of November, 1885. Right reserved to reject any or all bids. J. G. MINER,

Chairman Board of County Commissioners.

Attest: G. A. HAYES, County Auditor.

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PROPOSALS.

SMOKE-PREVENTING APPARATUS.

[At Chicago, Ill.]

Sealed proposals will be received at the office of the Committee Clerk of the Board of County Commissioners, Room 29, Court-House, **up to 2 P. M., Friday, February 20, 1885**, for the application of the six (6) steam-boilers in the basement of the court-house; all proposals to be submitted in accordance with the specifications now on file at this office; the right to reject any or all bids is reserved.

Proposals should be addressed to the undersigned, and indorsed "Proposals for applying Smoke-Preventing Apparatus." JAMES C. STRAIN,

Committee Clerk, Board of County Commissioners, Room 29, Court-House. 477

PAINTING, POLISHING AND GLAZING.

[At Kansas City, Mo.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., February 10, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 10th day of March, 1885**, for all the painting, polishing and glazing required for the custom-house, etc., building at Kansas City, Mo., in accordance with specification, copies of which and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,

478 Supervising Architect.

JAIL.

[At Scranton, Pa.]

OFFICE OF THE COMMISSIONERS OF LACKAWANNA COUNTY,
SCRANTON, PA., January 24, 1885.

Sealed proposals for the erection and completion of a county jail for Lackawanna County, to be located on the corner of Washington Ave. and New York St., in the city of Scranton, Pa., will be received by the undersigned Commissioners of said county, at their office **until Thursday, February 26, 1885, at 10 o'clock in the forenoon.** Plans and specifications will be on file at the court-house in the city of Scranton, on and after Tuesday, January 27, 1885. The builder to whom the contract shall be awarded will be required to enter into bonds with at least two approved sureties for the sum of $20,000, for the faithful performance of the contract. Work to be commenced within thirty days after the awarding of the contract, and to be finished on or before April 1, 1887.

The Commissioners reserve the right to reject any or all bids.

WM. FRANZ,
H. L. HALSTEAD,
WM. J. BURKE,
County Commissioners.

Attest: D. W. POWELL, Clerk. 478

STONE AND BRICK WORK, ETC.

[At Erie, Pa.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 27, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 28th day of February, 1885**, for furnishing and setting all the stone and brick work for the superstructure of the court-house, post-office, etc., at Erie, Pa., in accordance with specifications and drawings, copies of which may be seen and any additional information obtained at this office or the office of the local superintendent of the building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,

477 Supervising Architect.

IRON-WORK.

[At Great Kanawha River, W. Va.]

U. S. ENGINEER OFFICE, 378 ST. PAUL ST.,
BALTIMORE, MD., January 24, 1885.

Proposals for the iron-work of the pass of a movable dam on the Great Kanawha River, West Virginia, four miles below Charleston, embracing about 130,000 pounds of wrought, and 97,000 pounds of cast-iron, will be received at the U. S. Engineer Office, Charleston, Kanawha County, West Virginia, **until noon of February 14, 1885**, and opened immediately thereafter.

Specifications can be had upon application to Mr. A. M. Scott, Assistant Engineer at Charleston. Drawings will be exhibited and all necessary information given at the Charleston office.

WM. P. CRAIGHILL,

477 Lt.-Col. of Eng'rs, U. S. Army.

COURT-HOUSE.

[At Farmington, Me.]

January 26, 1885.

Sealed proposals will be received at the Clerk of Courts Office, Farmington, Me., **until 12 o'clock, M., Tuesday, February 17, 1885**, for furnishing the materials and erecting a court-house for Franklin County, at Farmington, Me.

Plans and specifications may be examined and all information obtained at the Clerk's office in Farmington and at the office of G. M. Coombs, architect, Lewiston, Me.

Proposals will be received for the whole or a part of the work and materials.

The right is reserved to reject any or all bids.

F. W. PATTERSON,
ISAIAH CHICK,
S. K. WELLMAN, County Commissioners.

477

COURT-HOUSE.

[At Clarinda, Io.]

CLARINDA, IO., January 9, 1885.

Sealed Proposals for building a court-house at Clarinda, Page County, Io., will be received at my office **until 12 o'clock, noon, Wednesday, February 18th, 1885.** Plans and specifications will be on file at the court-house in Clarinda, on and after February 1, and may be seen prior to that time at the office of Foster & Liebbe, Architects, Des Moines Io.

The right is reserved to reject any or all bids.

By order of the Board of Supervisors.

477 R. H. LYMER, Auditor.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS.

A CURIOUS discussion took place recently in the Pennsylvania Legislature, upon a matter which bears a distant resemblance to the question of architects' services. A bill is now pending before the Legislature for eliminating irresponsible persons from among the druggists of the State by requiring the registration of all those now exercising that profession, and the examination of all who shall desire in future to enter it. During the discussion some friend, not only of the medical profession but of humanity, proposed to amend the bill by adding a provision that no druggist should be allowed to fill a physician's prescription more than once without a renewed order from the physician. It was stated, in support of the bill, that one physician in Harrisburg had known a patient, after securing a prescription from his doctor, to have it filled at his own discretion a hundred and fifty times. Leaving out of consideration the effect of such practices on the health of the patient, the mover of the amendment was of opinion that the physician whose skill devised the prescription ought to have received his modest fee for it on each occasion when it was used. This does not seem an extravagant claim for the members of the worst paid of all professions except the Christian ministry, but another member rose and explained that the proposed amendment was "against the rights of the people;" and as Legislatures are very careful not to do anything which they are told is "against the will of the people,"— without inquiring how the person who tells them so happens to know anything about the subject, — the amendment was rejected.

ARCHITECTS, very naturally, have the same feeling as physicians, that their plans, like the prescriptions of the latter, are the expression of trained skill and labor, rather than bits of colored paper; and that the skill which produced them deserves to be rewarded whenever it is made use of. They think, too, that the persons who have taste enough to appreciate their skill ought to have a moral sense delicate enough to offer them suitable compensation when they wish to avail themselves of that skill, without waiting for the professional man to pursue them and claim his rights. The public, however, or at least the less scrupulous part of it, finds it convenient to call architects and doctors professional men when it wishes to make them responsible for the results of any mistakes of judgment, but to class them, like the Massachusetts statistician, as "manufacturers" of plans and prescriptions when it desires to fix the price which it wishes to pay for these productions. Unfortunately, the penalty of ruined health, or even death, which is generally attached to any tampering with physicians' prescriptions, has no counterpart in the relations of architects with their surreptitious clients, but it is at least consoling to observe that unauthorized duplicates or imitations of an architect's legitimate work usually have a certain quality which makes them and their owners ridiculous.

THE *Lumber World* makes the astonishing assertion that the loss to this country through forest fires is now not less than three hundred million dollars a year, simply through the destruction of available timber, without counting the additional loss from the annihilation of the young growth and the seeds scattered on the surface, and the scorching of the ground, which often renders it sterile for a generation. This enormous sum, about equal to the interest on the public debts of all the civilized nations of the world combined, is, according to the report of experts, annually thrown away forever by the people of the United States, without the smallest return in the way of comfort or satisfaction, but, on the contrary, at the cost of many lives every year, simply through the carelessness of boys and hunters, and of those more intelligent persons who ought to know enough to keep a sharp watch over these destructive animals. Next to human beings of feeble intellect, railway locomotives do most injury in forest countries, and the *Lumber World* inquires seriously whether the owners of such locomotives should not be compelled, in the public interest, to furnish them with spark-arresters during the dry season. The idea that railway companies are responsible for the value of timber destroyed by fires set from their locomotives undoubtedly has some effect in preventing legislative interference with their management; but it is so difficult to fix the kindling of a forest fire with certainty upon locomotive sparks, to say nothing of the obstacles in the way of collecting large debts from newly-established railway corporations, that the safer way would be to provide as far as possible against raising the question of responsibility by compelling the use of spark-arresters. Against animated incendiaries a forest patrol might be tolerably effective, but it would be still more useful to provide in some way for the removal of underbrush from woodland. Trees by themselves are not easily kindled, and the mischief is usually done through the ignition of dry leaves, ferns or bushes, which burn long enough to char, and at last to kindle the branches of the trees above them.

THE *Builder* gives us the first intelligible account we have seen of the effects of the dynamite explosions in London. In regard to the explosion in the Tower, we learn that instead of "blowing off the roof of the White Tower," as the first telegraphic despatches informed us, the dynamite torpedo, which was left upon the floor of what is called the Banqueting Hall, near the door leading from this room into St. John's Chapel, blew a hole in the floor beneath it, and threw over several stacks of rifles near by, the violence of the explosion twisting and breaking some of the rifles. Curiously enough, the pressure of the gas generated by the explosion lifted the ceiling of the Banqueting Hall, and with it the floor of the Council Chamber above, wrenching and breaking the glass cases, filled with Oriental armor, which stood there; and the same impulse, passing through the doorway into the Chapel, blew out the whole of the glass in the windows. The glass, which was all set in lead, was thrown outward, but, for some unexplained reason, the iron bars set into the window jambs to support the lead-work were forced inward, toward the interior of the church, breaking away the stone jambs by the force with which they were torn from their places. At Westminster Hall, thanks to the courage of the brave policemen, Cole and Cox, who picked up the torpedo and carried it away, little damage was done, and the beautiful roof is believed to have sustained no serious injury, the explosion having spent itself on the modern wood-work in the House of Commons.

THE Society of Architects of Northern France, which has for some time been noted as one of the most energetic and best conducted professional societies in the world, has just lost its distinguished president, M. Désiré-Théophile Sauvage, of Lille. M. Sauvage had nearly completed his sixty-first year, and was at the very height of his reputation as an architect of great talent, and of the most honorable character. In everything that could further the interests of his beloved profession he was always deeply interested, and although absorbed in business of great responsibility, he found time not only to direct with admirable skill the affairs of the Society which he did much to found, but to take an important part in the

deliberations of the Société Centrale, the general professional association in France.

THE *Builder* gives some statistics of the consumption of the finer sorts of timber in Great Britain, which are interesting. Although two-and-a-half million acres of forest still remain in Britain, most of the wood used there for building is imported from other countries, the value of the timber imports reaching an average of nearly one hundred million dollars a year. Framing timber is brought to England both from North America and from the Baltic ports, Russia, as it is well to remember, possessing more than half as much forest land as either the United States or Canada. North America now sends to England hard-wood timber, as well as pine and spruce; oak, elm, ash, birch and maple being regularly imported; while the rest of the world, with the exception of Russia, supplies little except fine furniture woods and veneers. In case of need, a great deal of excellent eucalyptus timber could be obtained from Australia, where these wonderful trees grow to a size far exceeding that of any other known species; but the cost of transporting the great trunks half-way around the earth renders their importation unprofitable, and the shipments of wood to Liverpool from the antipodes comprise only a few samples of richly-marked veneering blocks. From other tropical countries, however, a considerable amount of ornamental timber is brought. Mahogany stands at the head of the furniture woods, the average annual consumption in Great Britain being fifty thousand tons. Next, perhaps, to this in importance, singularly enough, comes sandal-wood, which is produced in immense quantities in India, and sent thence to all parts of the world, particularly to China, where it is used for a great variety of purposes. Ebony is another staple decorative wood, which is consumed in great quantities for inlaying, keys of musical instruments, and so on. There are several varieties of the tree whose heartwood forms ebony, and it is imported from India, Africa and the Mauritius, that from the last-named country being the blackest. The account says that five dollars a pound has been paid for fine pieces of ebony.

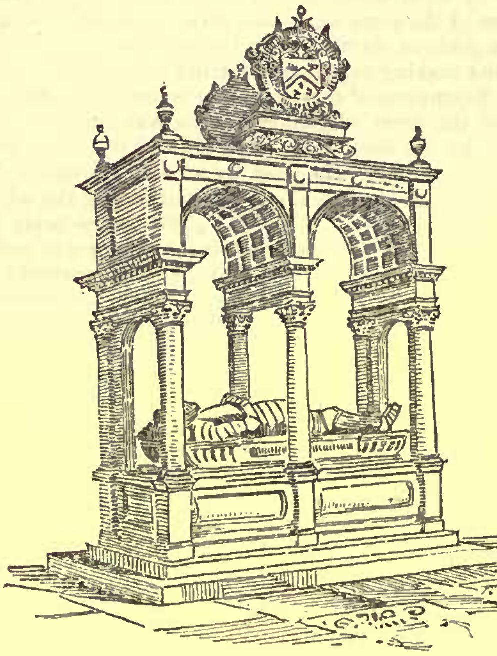
IN speaking of foreign timber, it is worth remarking that several varieties, belonging to countries on the very edge of the tropics, have recently been grown with perfect success in the Isle of Arran, on the west coast of Scotland, in latitude fifty-five, about as far north as the middle of Labrador, and within eleven degrees of the Arctic circle. The island, which is about twenty miles long by eight or ten wide, lies in the estuary which forms the mouth of the river Clyde, open to the influence of the Gulf Stream current which passes between Scotland and Ireland. A group of mountains, nearly three thousand feet high, occupies the eastern coast, and it is remarkable that although the east winds, which blow from the North Sea, are always the coldest in Great Britain, the Arran mountains seem to check the force of the winds which strike them, so that the climate of the eastern shore, just at the foot of the mountains, although apparently fully exposed to the cold winds, is exceptionally mild and even, and not only eucalyptus trees of various species, but palms and tree-ferns, grow luxuriantly. A specimen of the *Eucalyptus globulus*, or blue gum, which is destroyed by a temperature as low as twenty-seven degrees above zero of Fahrenheit's thermometer, has grown steadily for several years, and has now reached a height of thirty feet, and a diameter, five feet from the ground, of nearly seven inches. Among the palm-trees are one or two which have been growing there for twelve years, and all are said to be now in perfect condition. Arran is a wild, rocky place, inhabited mostly by herring fishermen, who care little for experiments in arboriculture; but if it could be made to grow eucalyptus timber there would hardly be a more valuable producing district in Great Britain, for the eucalyptus trees not only grow very rapidly, but furnish a wood which, without any preservative treatment, has been known to remain buried underground for fifty years without rotting; and the demand for such timber from the railway companies, for their ties, would, if it could be supplied, be great enough to keep all Scotland at work growing the trees.

A QUESTION of architects' responsibility was recently brought before the editor of *La Semaine des Constructeurs.* An architect was employed by the authorities of a certain place to design a town-hall. The plans were made and approved and contracts were entered into for carrying them out; the City Council reserving the right of supervising the work. In the course of construction changes were made in the plans, by which some of the piers were done away with, and iron girders inserted in place of them to carry the walls above. The architect, without making any charge for the service, calculated the necessary dimensions of the girders, in consultation with an engineer; but the form suggested by him was rejected as "too expensive" by the town authorities. The latter then adopted a plan for the girders submitted by an iron-worker, and contracted with him to furnish them, without asking the advice or consent of the architect. While the girders were being put in place, one of them gave way, and the building was seriously damaged, both by the fall of the girder and the masonry about it, and by the cutting and underpinning needed to restore the work to its position. Finally, the building was completed, and for a long time no movement was observed; but after five years of use a piece of a cornice fell off, bringing with it some plaster ornaments. It was observed, after the fall of the cornice, that some of the iron ties which held the plaster to the wall were detached, but in spite of this evidence that the fall of the plaster was due to the dislocation of the irons, the town authorities promptly began a suit against the architect for damages on account of imperfections in the plaster-work. The contractor who did the plaster-work was still at hand, but he had failed not long before, and besides, the town councillors, as often happens in other countries, were probably too politic to risk offending a person who employed a considerable number of workmen so long as they could choose a professional man for a victim.

THE architect, arguing from the evidence afforded by the broken cornice moulding, maintained that the plaster-work was good enough for its purpose, and that the fall of the cornice was due to the detaching of the ties at the time when the fall of the girder had shaken the masonry of a large part of the building; but, independently of this consideration, he was anxious to know how far his responsibility would be involved in the fall of badly-executed plastering under the circumstances. The editor, or rather, M. Ravon, the Secretary of the Committee on Jurisprudence, replies that if the accident were really due, as the architect thought, to the disorders caused in the structure by the breaking of a girder contracted for directly by the town authorities, without the advice of the architect, the latter could not be regarded as in any way responsible; while, even if the occurrence had been due to the bad quality of the plaster-work, the contractor, who sold the materials, and furnished the men who did the bad work, would be solely responsible for the consequences, even though the architect might, by special diligence, have discovered the inferiority of the materials while the work was going on. In the present case, however, the town councillors could not claim even the poor consolation of reproaching the architect for what he might or might not have done; for their own contracts expressly provided that the supervision of the work was reserved to them, and whatever fraud had been committed was carried on under their own official surveillance.

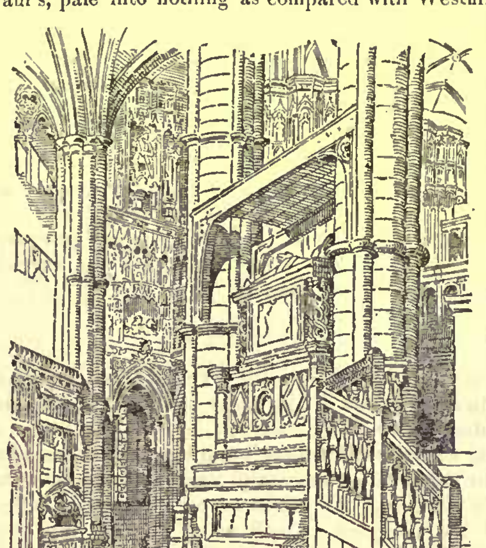
OUR readers can just at this moment give us some little assistance, if they will, and at the same time afford one another a modest share of amusement, by sending to us a postal card giving the title of the ten buildings which the subscriber believes to be the most successful examples of architectural design in this country. As it will be only natural to mention the name of the designer as well as of the building, the vote we propose will have an element of human interest, also, as the designers of the best ten buildings — if the vote cast be sufficiently large — may properly be considered to be enrolled in that highly elect but, at present, nebulous fraternity styled "leading architects." It is hardly necessary to say that no vote will be counted that does not bear the voter's name in full. Our object is not at all to offer incense to the leading lights of the profession, but merely to discover how far our illustrated record of American architecture is imperfect at this time, and to what degree our improved facilities will enable us to fill up the existing gaps, by publishing more or less of the fifty or more buildings which will be enumerated by those who respond to this suggestion.

STATUES AND MONUMENTS OF LONDON.[1] — III.



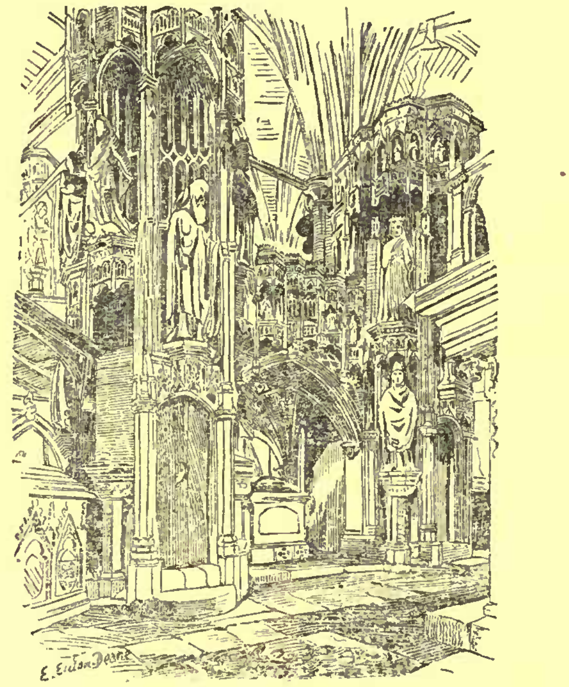
The Gresham Monument, St. Helen's, Bishopsgate, London.

PASSING from the statues in the open air to monuments in churches or public buildings, we enter upon a much wider range. Great, however, as is the number of men whom London has honored, the places where their memorials are to be found are few. Westminster Abbey, St. Paul's, and the Houses of Parliament almost exhaust the list. There are a few monuments erected by the Corporation of London in the Guildhall. Some of the older churches which have survived the Great Fire of London contain monuments of interest; of these, St. Helen's, Bishopsgate Street; St. Olave's, Hart Street, where Pepys was buried; the Rolls Chapel in Lincoln's Inn, the Temple Church, Chelsea Old Church, and St. Margaret's, Westminster, nearly exhaust the list, although here and there a church may contain an individual monument worthy of a visit, such as Battersea Church, where there is a monument to Bolingbroke by Roubiliac; St. Saviour's, Southwark, where we find the interesting tomb of Gower, the poet; and St. Catherine's, Cree, where Holbein was buried, and which contains a beautiful recumbent effigy in armor of Sir N. Throgmorton, (1570). All these together, including St. Paul's, pale into nothing as compared with Westminster Abbey. It may seem to be a work almost of presumption on my part to refer to its monuments, after the singularly interesting and full treatment which they have received from one who loved the Abbey so well, and whose name will ever be associated with it, — Dean Stanley. His work, however, is mainly historical, and on this side leaves nothing to be desired. On the technical side, and from the point of view of the progress of monumental sculpture, there is much still to be said, far more than I can do in the few pages of an article. If I venture to say anything on this subject, it is that for many years of my life I lived under the shade of the Abbey or in its immediate vicinity, and few people, except those connected with its services, have been more familiar with it. During the last three years I have had to deal officially with many questions in connection with the Abbey. The last time I saw Dean Stanley, I spent some time with him in inspecting the statues of the North Transept, with the object of determining a site for the monument voted by Parliament to Lord Beaconsfield. Speaking, then, with a long experience, I can express my conviction that there is nothing comparable with Westminster Abbey, having regard to its combination of architectural, historic and artistic interest.



Entrence to Chepel of Edward the Confessor, Westminster Abbey.

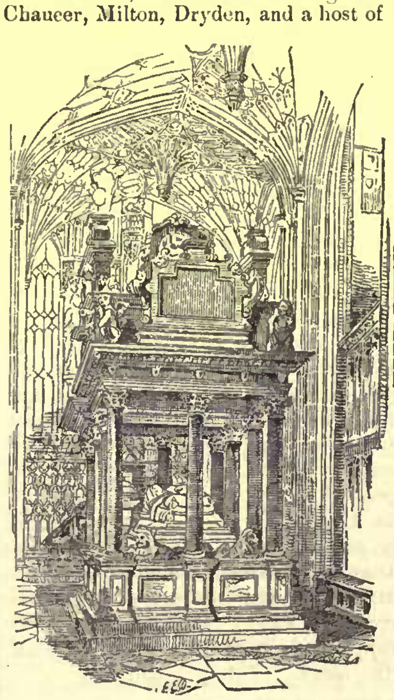
There is nowhere else in the world so long a range of monuments, from the shrine of the Confessor, the tombs of the Plantagenets, to the monuments of poets and the more recent statues of statesmen, without any break, and all set in a framework so beautiful and so full of grandeur that, much as one may take exception to many of these works of monumental sculpture, they sink into insignificance in the building, and do little or nothing to diminish the beauty of the whole, while they add to its interest. If any one doubts this, let him enter the Abbey by the door of the North Transept, and stepping across the graves of Chatham, Pitt and Fox, pass between the avenue of statues of Chatham, of the two Cannings of Palmerston, of Peel; or let him enter by the Poets' Corner, and treading the tombstones of Samuel Johnson, Garrick, Macaulay and Dickens, find himself among the monuments and records of Chaucer, Milton, Dryden, and a host of others, the boast of English literature; or let him stand in the choir, behind the altar, with the noble range of tombs of our early kings on either side; or let him be present on an occasion when one of the great men of England is laid in his last resting-place, amid a crowd of all that is most eminent, and with a pomp so solemn, so touching, that no other ceremony compares to it. It may be asked with confidence whether any other building can produce the same impressions of grandeur, dignity and beauty combined with those of historic and national interest.



Shrine of Henry V, Westminster Abbey.

The monuments may be studied best under the following groups: —

1. The monuments and tombs of our kings and their families, beginning with the shrine of the Confessor, and ending with the monuments of Elizabeth and Mary.

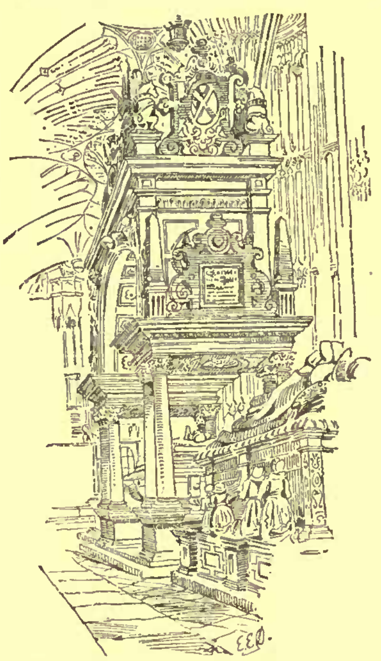


Tomb of Queen Elizabeth, Westminster Abbey.

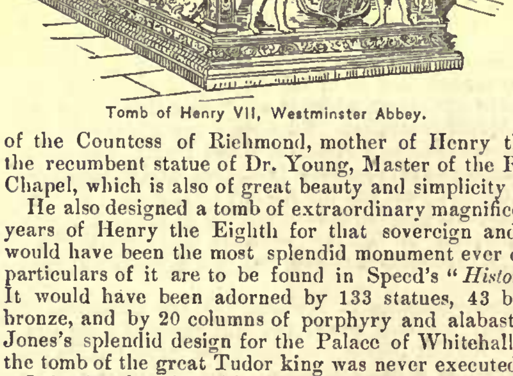
The oldest of these monuments are ranged on either side of the choir at the back of the altar; the tomb of Henry the Fifth, with a chantry of its own, is at the east end of the Chapel of the Confessor. These monuments cover a space of time from 1272, the date of the translation of the Confessor to his present tomb, to the re-burial of Mary, Queen of

[1] A paper by Mr. G. Shaw Lefevre, reprinted, with added illustrations, from the *Nineteenth Century*. Continued from page 76, No. 477.

Scots, in 1606, a period therefore, of 234 years. Nothing can better show the growth of art than the difference between the simplicity and grandeur of the earlier monuments, and especially those of Henry the Third and Richard the Second [see Illustrations], and the lavish wealth of decorations upon those of Henry the Seventh, Elizabeth and her sister Mary, and that of Mary, Queen of Scots. It will be observed to what extent foreign artists were called in for the purpose. The figures of Henry the Third, and of Queen Eleanor, wife of Edward the First, are by competent authorities said to be by an Italian sculptor; that of Philippa, wife of Edward the Third, by a Hainault artist; the monument of Anne of Cleves by an artist brought over from Cleves for the purpose; that of Henry the Seventh and his wife, and that of Margaret, Countess of Richmond by Torregiano, the rival of Michael Angelo; that of Elizabeth and her sister Mary by Maximilian Poultraine and John de Critz; and that of Mary Stuart by Cornelius Cure. Not the least value of the earlier monuments is that the recumbent statues are evidently likenesses, and tally with the personal descriptions we have of these monarchs. The figure of Henry the Third is represented as small and delicate, two long curls of hair fall from under his coronet; there is a beard and moustachios: there is a great charm in the simple pose of the statue and its flowing drapery. The material is bronze, and is said to be the first specimen of metal-casting in England. The figure of Richard the Second is also in bronze; it is habited in a religious costume; his queen is represented with a pleasing countenance; their hands were originally clasped, but the arms have unfortunately been broken off. In the effigy of Edward the Third (1377), the face is long, and there is a remarkable fall of the lower lip. The hair is long and slightly curling, and the beard is an amply flowing one. The drapery is treated conventionally. The effigy of Henry the Fifth is now but a rude wooden form on which were fastened plates of silver gilded, long since stolen from the monument. How splendid these tombs must have been, and indeed the whole of this part of the Abbey, when in the time of Henry the Seventh they retained all their magnificence, and when the profusion of minor statues and decorations about them was still unbroken.


Tomb of Mary, Queen of Scots, Westminster Abbey.

The most beautiful, and indeed the finest monument in England, is that of Henry the Seventh. Lord Bacon speaks of it as "one of the stateliest and daintiest in Europe." Torregiano was engaged on this work for nearly six years, and the result was a masterpiece. During this time he also produced the beautiful tomb of the Countess of Richmond, mother of Henry the Seventh, and the recumbent statue of Dr. Young, Master of the Rolls, in the Rolls Chapel, which is also of great beauty and simplicity of style.


Tomb of Henry VII, Westminster Abbey.

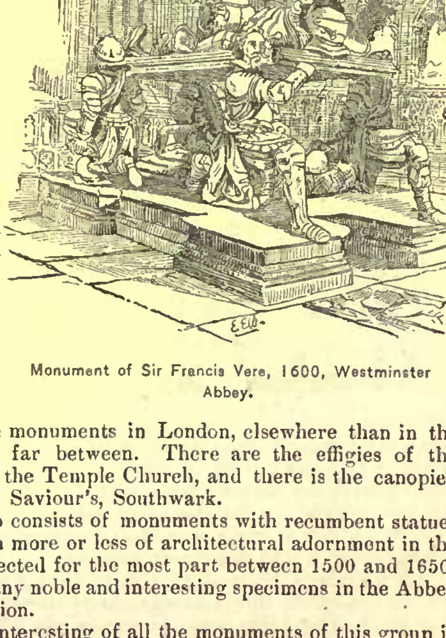
He also designed a tomb of extraordinary magnificence in the early years of Henry the Eighth for that sovereign and his queen. It would have been the most splendid monument ever conceived. The particulars of it are to be found in Speed's "*History of England.*" It would have been adorned by 133 statues, 43 bas-reliefs in gilt bronze, and by 20 columns of porphyry and alabaster. Like Inigo Jones's splendid design for the Palace of Whitehall, this design for the tomb of the great Tudor king was never executed.

It is singular that although the royal burials were continued from James the First to George the Second, inclusive, with the exception of Charles the First, James the Second, and George the First, yet no monuments were erected to them in the Abbey, but, as already shown, statues in the public places appear to have taken the place of monumental tombs.

2. The second group which may be studied together consists of the tombs of the early feudal chiefs, some of them closely related to the sovereigns, and the purely Gothic monuments of a somewhat later period.

The best examples of these in the Abbey are the tombs of Edward Crouchback, Earl of Lancaster, 1273, an exceedingly noble and dignified effigy [see Illustrations], and of Aylmer de Valence, Earl of Pembroke, 1323, nephew of Henry the Third. Flaxman says of them: "They are specimens of the magnificence of such works of the age; the loftiness of the work, the number of arches and pinnacles, the lightness of the spires, the richness and profusion of the foliage, the solemn repose of the principal figures representing the deceased in their last prayers for mercy, the delicacy of thought in the group of angels, and the tender sentiment of concern variously expressed in the relatives ranged in order around their basements, forcibly direct the attention and convey the thoughts, not only to other ages, but to other states of existence."[1] Of others of the same date are the tombs of William de Valence, Earl of Pembroke, half-brother of Henry the Third, with an effigy of wood covered with gilt copper, and with beautiful specimens of enamelled metal on the shield, belt and cushion [see Illustrations]; of John de Eltham, Duke of Cornwall, 1334, a noble figure [see Illustrations] with legs crossed; and of Simon de Langham [see Illustrations], Archbishop of Canterbury, 1376, a beautiful alabaster figure, in excellent preservation, on an altar-tomb in the Chapel of St. Benedict.

Besides these, in somewhat later times, there are the purely Gothic tombs of Sir Barnard Brocas, 1400, in the Chapel of St. Edmund; of Ludovick Robsart, 1432; of Philippa, Duchess of York, 1480; and lastly, the well-known monument of Sir Francis Vere, 1600, where, above a recumbent figure of Vere himself, four knights kneeling support the arms of the dead man — a monument in imitation of that to Engelbert, Count of Nassau, at Breda. This monument is one of the most beautiful in the Abbey. It is of this that the story is told of Roubiliac, that in reply to a question thrice repeated by one who found him standing with his eyes riveted on the fourth knight, he said, "Hush! hush! he will speak presently." The monument is somewhat of a survival, for most of the monuments dating between 1500 and 1600 have more or less of the Renaissance about them.


Monument of Sir Francis Vere, 1600, Westminster Abbey.

The purely Gothic monuments in London, elsewhere than in the Abbey, are few and far between. There are the effigies of the Knights Templars in the Temple Church, and there is the canopied tomb of Gower in St. Saviour's, Southwark.

3. The third group consists of monuments with recumbent statues mostly canopied, with more or less of architectural adornment in the Renaissance style, erected for the most part between 1500 and 1650. Of these there are many noble and interesting specimens in the Abbey well worthy of attention.

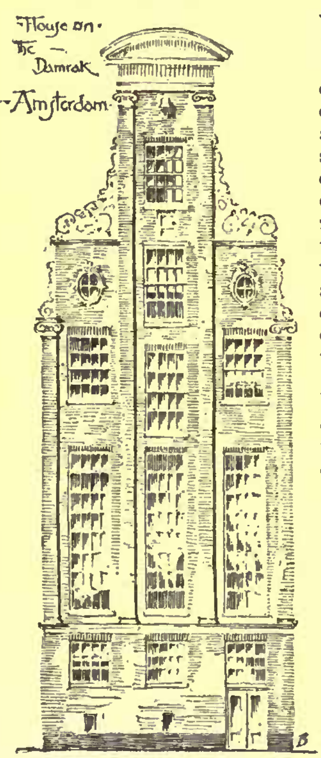
Perhaps the most interesting of all the monuments of this group is that of Sir H. Norris (1600), whom Queen Elizabeth so loved, not merely for his own sake, but because of his father, who alone of those who died on the scaffold with her mother, Anne Boleyn, denied her guilt. Norris and his wife are represented under a canopy; on either side are three kneeling figures, life-size and armored, the six sons, four of whom died in battle and one alone survived the father. The monument is of great size, and the artist, whose name is unknown, has been most happy in depicting the parents reposing in death, while their sons are praying around them.

There is also the monument of Sir Charles Daubeney and his wife, 1507, a recumbent statue on an altar-tomb, the four corners to which are purely classic, showing the influence of the Renaissance; this is in the Chapel of St. Paul, where also are the monuments of the Countess of Sussex, 1589; Dudley Carleton, 1631, half recumbent; and other monuments to many noble ladies of that period; the Marchioness of Winchester, 1586; Frances, Countess of Hertford, 1598; the Burleigh Monument, 1588; Sir John Pickering, 1596; Sir R. Picherall, 1571; Countess of Suffolk, 1563; Lord John Russell, 1584;

[1] Flaxman's "*Lectures on Sculpture,*" p. 20.

the Earl and Countess of Exeter, 1608. It is unnecessary to name more; the Abbey is very rich in them. In most of them the figures are recumbent, on altar-tombs, with canopies, or architectural structures against the walls of the church, often reaching to a great height, and always showing more or less of classical detail about them, while on the other hand the Gothic treatment of many of their parts is not abandoned. The most sumptuous monument of this period is that of Villiers, Duke of Buckingham, 1628, in the central aisle of Henry the Seventh's Chapel [see Illustrations]; and one of the most beautiful is that of Lord Middlesex and his wife, 1645, in the Chapel of St. Benedict. It is also one of the last of its type, for already, under the influence of new ideas, and of a fresh generation of sculptors, the fashion of recumbent statues and altar-tombs was going out of date. We have many fine specimens of this style in other parts of London, such as the monuments of Lord and Lady Dacre in old Chelsea Church; of Jane Dudley, Duchess of Northumberland, mother-in-law of Lady Jane Grey, in the same church; of Sir Walter Mildmay at St. Bartholomew's the Great; and of many city magnates in St. Helen's, Bishopsgate Street. It is to be noticed how many of these monuments are erected in honor of noble ladies, and that in almost all cases the wife is lying on the altar-tomb beside her husband. In the next generation ladies are treated very differently, and very few of them are represented on the monuments to their husbands. In the last half-century only two ladies have been buried in the Abbey.[1] It is also to be observed that we know the names of but very few of the sculptors or architects of these splendid tombs.

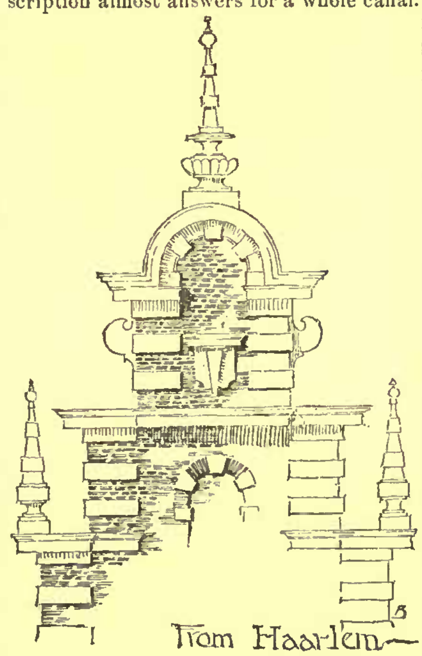
A WINTER TRIP THROUGH HOLLAND.



UNTIL comparatively a few years ago, Holland was considered as being too much out of the way, and possessing too little of interest for the ordinary tourist, and even the architectural student seldom found his way in among the dykes and windmills; but the painters set the fashion by making summer excursions thither, returning with canvasses so full of interest that the tourists soon followed, until at present the attractions of the country are apt to be over estimated, especially since Abbey and Boughton have done so much to popularize Dutch possibilities. Fergusson in his "*History of Architecture*" speaks of the people as being of nearly pure Aryan blood, whence, in accordance with his ethnological theory of architecture, nothing of any great or lasting merit can be expected of them in the way of monuments. At the time Fergusson wrote, the so-called Queen Anne had not yet taken its place among the imported English styles of building, and Dutch architecture was but little known. Still it is doubtful if he would see fit to change his opinion now, even though his countrymen have inspired themselves so freely from the land in question. Holland possesses no architectural monuments, properly so called; but on the other hand it abounds in numerous examples of domestic architecture, especially in combinations of brick and stone constructions, which certainly have the merit of being straightforward and honest in design, well adapted to the climate of the country, generally pleasing in effect, and full of suggestive ideas to one who expects to practice architecture in a land like North America.

On first entering Holland, an American is apt to be much impressed with the number of things he encounters which have a familiar air. After all, Yankee ideas were not exclusively derived from old England. It will be remembered that the first settlers in Massachusetts Bay sailed from Leyden, and had not for a number of years been residents of the mother country. They brought many Dutch customs with them, besides the tall, sugar-loaf hats and the knickerbockers, and the remembrance of their Holland homes was strong enough to show through all the building operations which took place during the early days of the colony. What we now designate as the old Colonial style is very nearly akin to much of the old brick architecture still existing in many portions of Holland. Nor does the resemblance cease with the exterior. The typical swell-front Boston house is essentially English in plan, but our detached houses seem to follow very closely in arrangement the private dwellings, such as are still found in the suburbs of Haarlem. And the porches and verandas, the familiar square house with a roof hipped all around, the overhanging eaves, none of these features seem to find any prototype in England, whereas all of them are used in Holland, and used in a manner so much like our own, that a New Englander suddenly dropped in the Heerenweg, just outside of Haarlem, would with difficulty be persuaded that he was not in one of the new suburbs of Boston. Two centuries of building operations, and constant intercourse with other countries, have not sufficed to materially change the typical plan brought by the Pilgrims from Holland; and with all our improvements in methods and details, we have left the old traditions only to return toward them in these latter days. Compare Salem, Mass., and Haarlem, Holland. The inhabitants of many of the respective houses could change places and hardly appreciate the difference. Not that Salem is in anywise a Dutch town, or that Hawthorne would have seemed at home in Haarlem; but the resemblance between some of our early Colonial architecture and its North Sea prototype is too strong to be overlooked.

The Dutch are not a progressive people; they got over all that when William of Orange left for England, and their ways of living and building have changed very little since then. They know they build their houses well; they are sure they keep them clean, and any more they do not ask for. Hence there is a simplicity in the way they use brick, which arises from naturally met conditions, and which is productive of some very pleasing results. It will be remembered that the greater part of Holland lies several feet below the sea level, consequently stone is rare and expensive, and in the larger cities many of the houses are constructed without any stone at all, the window-sills, even, being of rounded brick. Amsterdam in particular is full of quaint old brick houses. The long canals are lined with them, many stories high, crowned by curious gables, the roof seldom showing any more than is indicated by the irregular outline of the top. Many of the houses have settled badly, though this is due to the insecure foundation afforded by piling, the masonry usually appearing to be very well laid. The style of finish is so uniform that one description almost answers for a whole canal. A base several feet high is painted black or dark green. The bricks above are painted a dark chocolate, very strong in tone, the color apparently being put over the whole, though in some cases the joints are lined off with a darker tone. Occasionally a house is met with where the bricks are left unpainted, but even then they are burnt very dark, not a dingy red, but a clean, deep reddish brown. Only in the newest houses is light brick or white mortar used, and then the effect is far from pleasing by contrast with the quiet tones of the old work. The window-frames are painted white, the sashes dark green, or occasionally white, though the heavier color seems more successful. The muntins are always very large and the staff-beads three inches or more square, set nearly flush with the face of the wall, and perfectly plain except for a small bead at the inner edge. In no cases do the reveals appear to be more than four inches. The sashes slide like ours, the lower one only being weighted. The gables generally follow some pseudo-classic outline, with a crowning cornice of wood. At the sides are some ornamentations in stucco, counting for absolutely nothing as detail, but chiming very pleasingly with the general effect of the building. The cornice and stucco-work are painted white. Finally in the highest part of the gable is always a projecting beam and tackle for hoisting goods to the loft, which is used as store room.

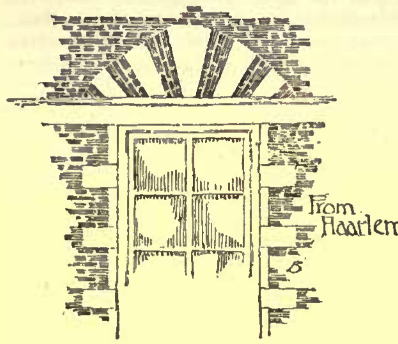


This description implies a building about as simple and cheap as could be imagined, but by a judicious use of long pilasters, a few bits of detail in the way of caps and bases, and a variation in the contour of the gable, an almost endless variety of fronts is obtained, each following the general scheme, and so giving the needed quiet and congruity to the looks of the street, while in every case there is an opportunity for individual treatment. Excellence and cheapness are not usually found combined in a series of street fronts; and while Amsterdam can hardly be said to possess handsome streets, some portions of the Kloveniersburgwal and the Keisers Gracht have a quite dignified appearance that goes far toward making up for lack of any monumental magnificence. In fact the Dutch are too intensely practical and personal in their nature to ever rise to a monumental conception.

There are no good churches in Holland. Of the Cathedral of Utrecht, the best part tumbled down, and was removed long ago, while the St. Jan's Kirk at Bois-le-Duc shows too many foreign influences to be classed as a home product. One exception can be made, however. At Bommel is a little church, with a tremendous west tower, recalling some of the best Flemish types; — a good mass and just enough detail for effect; — ending abruptly, but very coherent in design. In few other cases are the churches worth more than a passing glance.

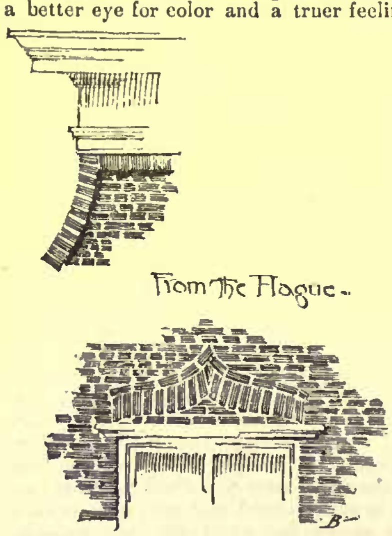
[1] Lady Palmerston and Lady Augusta Stanley.

About the end of the sixteenth century a style of brick and stone architecture was developed in Holland, which can almost be called peculiar to the country, though possessing many points in common with the coeval architecture of Germany and North Belgium. About the best example of this style is the Flescher's or Butchers' Hall in Haarlem, some sketches from which are given herewith. The mouldings and details are quite well chosen, and, with the excellent effect of color, from the contrast of the deep, cherry-red brick and the pale, yellow sandstone quite atone for the degree of fussiness due to a frequent use of small pyramidal pinnacles, and curved horns on the sides of the gables. There are two other very excellent buildings of this class in Holland, the old Stadhuis at Leyden, and the Asylum at Groningen. The Province of Friesland, the most northerly of Holland, is quite rich in brick and stone work of the sixteenth and seventeenth centuries, but it is so far out of the line of travel that it has been very little explored.



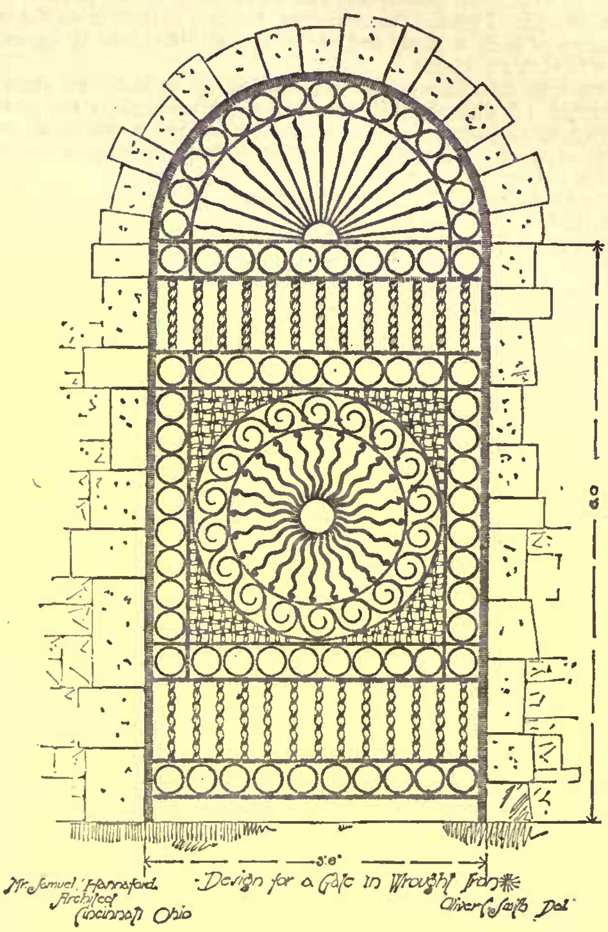
It is hardly fair to say that the present treatment of English Queen Anne work in brick and stone is taken directly from Holland, though even a traveller passing hastily through the country cannot but be struck with the extent to which the present generation of British architects have been enabled to draw on the comparatively slight architectural resources of Holland. In many respects the modern inspirations are ahead of the old work, though time and congenial surroundings give an air of quiet good taste and respectability to the Dutch buildings, which even Flemish bond and imported workmen do not wholly succeed in reproducing on the Chelsea embankment. The Dutch work seems good, first, because it is unobtrusive; secondly, because a good effect of color is usually produced; and thirdly, because, however meaningless some of the stucco ornamentation may seem, or however barren the front may be of detail, one feels that for the whole there was a definite purpose in the mind of the builder, and that the design is consistent with that purpose, being neither a half-Greek temple nor an abortive Renaissance palace, but a simple, straightforward Dutch house — a little flat-footed, if you like, but substantial and satisfactory; and finer finish or a greater profusion of detail could hardly help so simple a model.

From an architectural point of view, a fortnight's trip through Holland will well repay the student, while even a six months could be profitably devoted to it. But the country possesses another form of attraction in its picture galleries, which in some lines of art are richer than anything else in Europe. They are all too well known to require any description. Surely the architect can be an artist, as truly as he who handles the brush, and if, after a stay among the old tone-masters of the Dutch galleries, a man does not come away with a better eye for color and a truer feeling for mass and breadth in design, it is no one's fault but his own. A good deal of architecture is found in some of these canvasses. Old Pieter de Hooch and merry Jan Steen gave us as good insights of the interiors of the old Dutch homes as Haarlem or Amsterdam can now give us of what the exteriors may have been. The painting in the Museum of The Hague entitled "The Young Housekeeper," by Gerard Douw, presents a study of a Dutch interior such as could hardly be found existing to-day — rich, heavy draperies artistically looped back from the quaint, deep-mullioned window, a suggestion of a fine old staircase in the background, a curiously-wrought brass chandelier hanging from the oak ceiling, and a few bits of delicately-carved furniture, all in a glow of warm tones centering on the mother and child in the foreground. It is only one of the many old paintings peculiar to Dutch art, from which both painter and architect can draw ideas of immediate practical value in their respective professions. The old Dutch architects built homes, the old Dutch artists painted homes, and both left behind them a wealth of home ideas, from which we, who are so nearly allied to them by race and habits, can draw valuable suggestions.



C. H. Blackall.

A ONE THOUSAND FOOT TOWER.



OUR builders in this age, which is justly styled the age of steel and iron, have so thoroughly learned to take account of the resistances of these metals, that in very truth there seems no conception, howsoever grandiose it may be, before which they recoil.

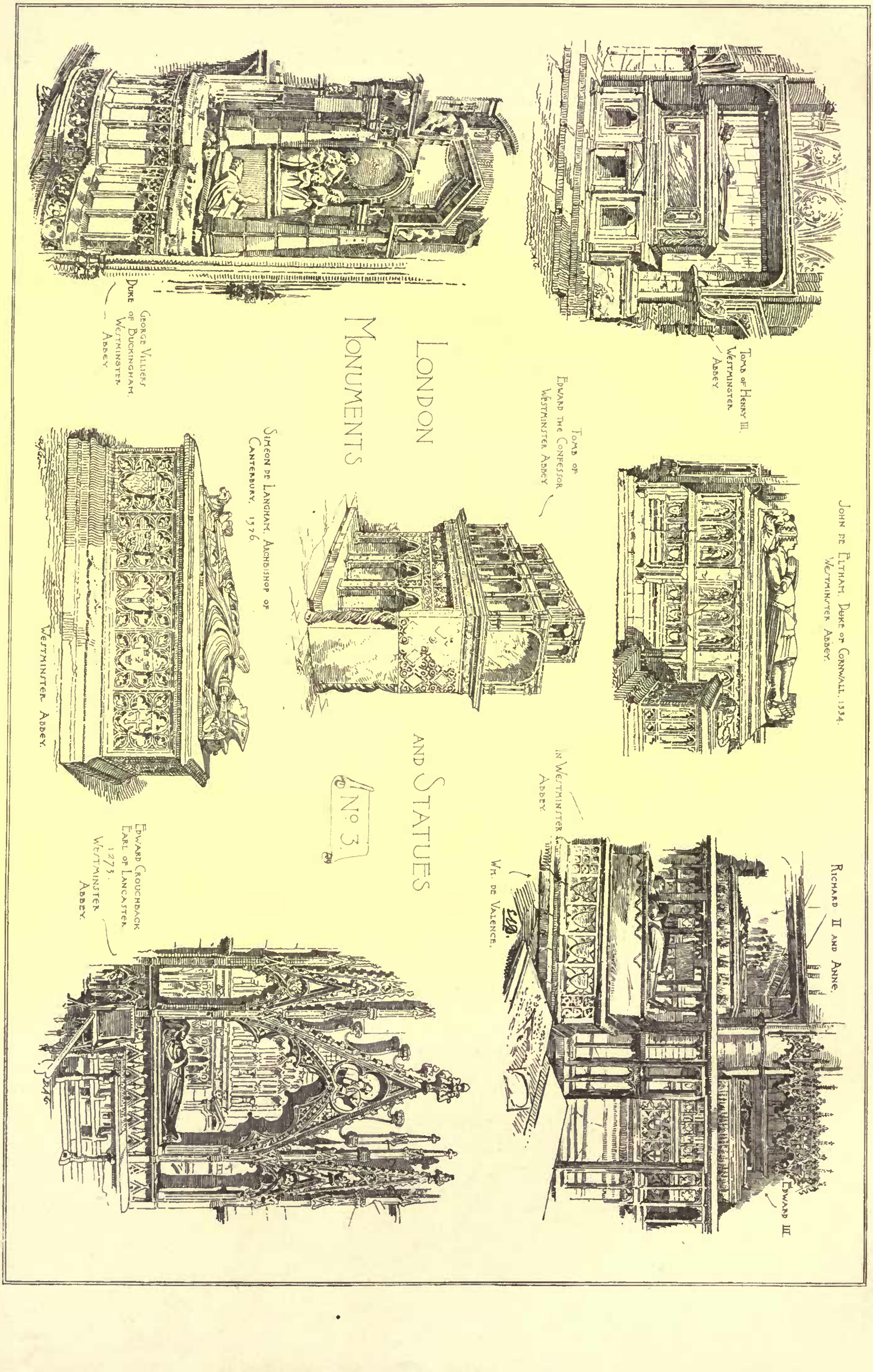
For a long time Americans have held the first rank in these bold experiments, which characterize the studies of that genius which pleases itself in pushing to its extremest limit the resistance of metals; but rivalry has sprung up as soon as, behind the accomplished *tours de force*, was seen rising up the possibility of carrying out works which had been declared absolutely impossible of realization. It is thus that we have seen valleys, which had formerly been reputed unbridgeable, crossed by a single elegant arch, as in the case of the Douro and Garabit bridges. It is thus that we stood wonder-struck before the gigantic iron skeleton of the statue of Liberty Enlightening the World, offered by France to the United States, which surpasses in dimensions the famous colossi of antiquity.

At this moment the idea of a celebration without parallel in commemoration of the centenary of 1789 haunts the imagination of our artists, our architects and our builders. A great world's fair decided for this date, with proportions that no other enterprise of the kind has ever reached in the history of the world, serves for the moment as a basis for a myriad of stupendous projects whose assemblage would join in giving to the occasion which is now being elaborated a glory worthy of the nation which prepares it, and in harmony with the ideas of progress which it is destined to symbolize.

These grand projects will see the light in due time. Their artistic originality merits that they should be examined, and even studied with care, together with the central idea which is the celebration of the centennial. For when a project takes on sufficient body to become practically possible aside from mere financial considerations of carrying it out — which are considerations of another kind — and when the project by reason of its extent and novelty solves difficulties considered up to that time insurmountable, it carries with it a real teaching which cannot be passed over in silence: a work of which the possibility is demonstrated virtually possesses an existence which takes it out of the sphere of mere conception. Such is the case with the monumental tower, 300 metres in height, proposed by M. G. Eiffel as an annex to the Exposition of 1879, and studied to this end by MM. E. Nouguier and Kœchlin, the engineers of his house, and by M. S. Sauvestre, architect.

The colossal requirements of the problem have not stopped them. They seem to consider them only a natural extension of the enormous works in metal which they have already executed, and they do not even admit that even this must be considered as the maximum result which can be obtained through the assemblage and superposition of metal work.

It is to 1875, to the time of the Centennial Exhibition at Philadelphia, that one must turn to search for the idea of constructing a


London Monuments and Statues
No 3.
George Villiers Duke of Buckingham. Westminster Abbey
Tomb of Henry III. Westminster Abbey
Tomb of Edward the Confessor Westminster Abbey
John de Eltham, Duke of Cornwall, 1334. Westminster Abbey.
Simeon de Langham, Archbishop of Canterbury, 1376
Westminster Abbey.
in Westminster Abbey.
Wm. de Valence.
Richard II and Anne.
Edward III
Edward Crouchback Earl of Lancaster 1273. Westminster Abbey.

TOUR DE 300 MÈTRES

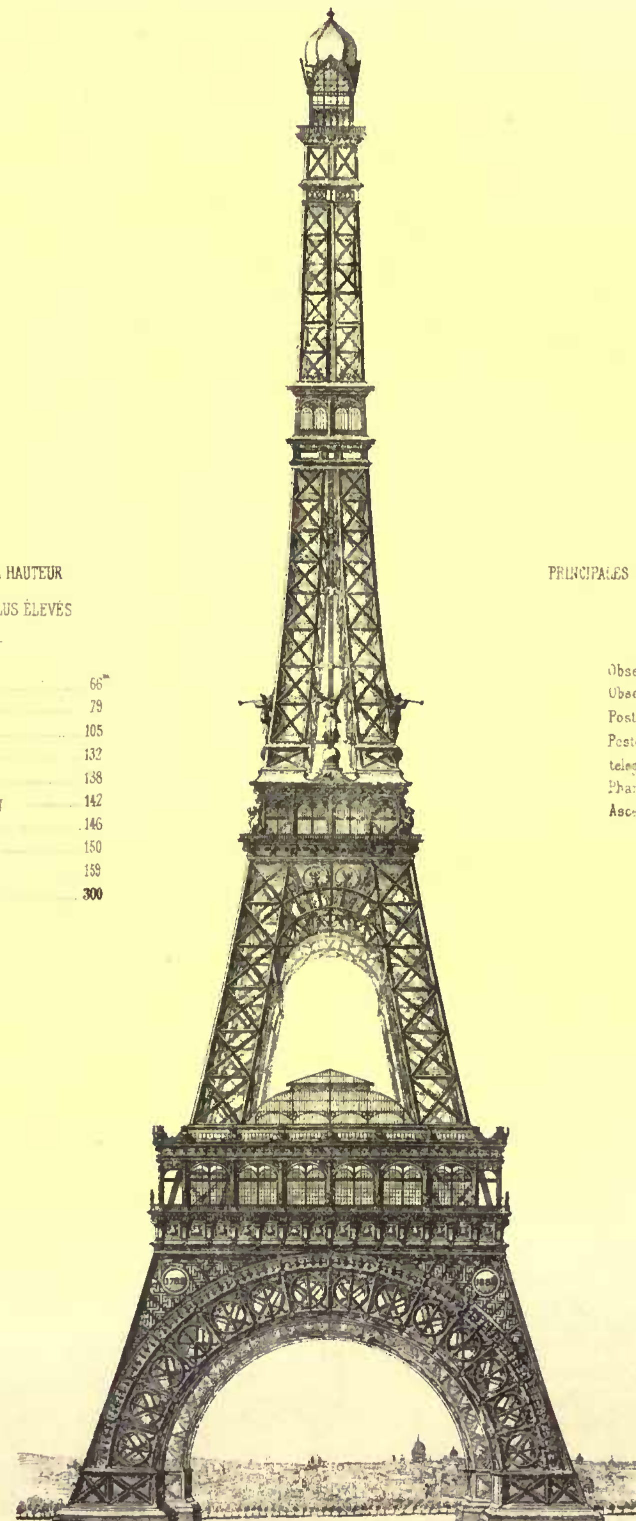


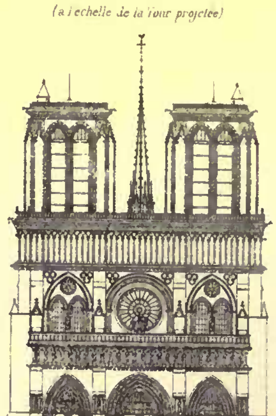
TABLEAU INDIQUANT LA HAUTEUR
DES MONUMENTS LES PLUS ÉLEVÉS

Tours Notre-Dame	66^m
Pantheon	79
Flèche des Invalides	105
St Pierre de Rome	132
Cathédrale de Vienne	138
Cathédrale de Strasbourg	142
Gde Pyramide d'Egypte	146
Cathédrale de Rouen	150
Cathédrale de Cologne	159
Tour projetée	**300**

PRINCIPALES APPLICATIONS DE LA TOUR DE 300^m

Observatoire météorologique
Observatoire astronomique
Poste d'observations stratégiques
Poste de communication par
telegraphe optique
Phare pour l'éclairage électrique
Ascension du public à 300^m de hauteur

Notre-Dame de PARIS
(à l'echelle de la Tour projetée)



Arc de Triomphe de l'Etoile
(à l'echelle de la Tour projetée)

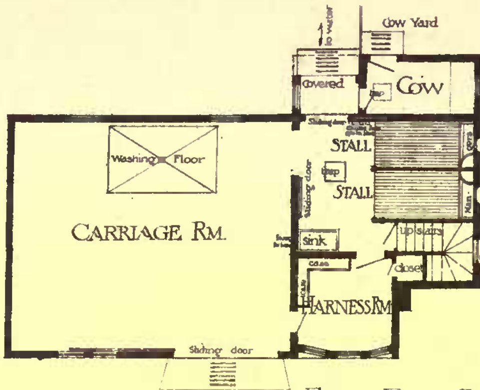


PROJET DE MONUMENT COMMÉMORATIF
A ÉRIGER A L'EXPOSITION UNIVERSELLE DE 1889
Présenté par M. G. EIFFEL, Ingénieur-Constructeur.

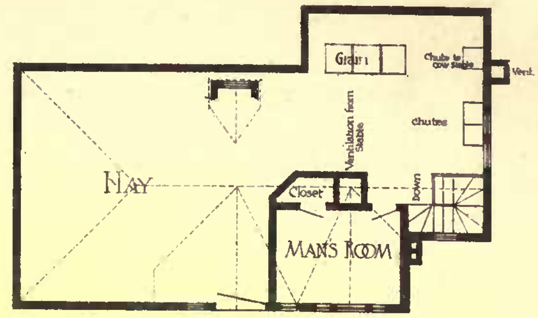
Projet de Messieurs E. NOUGUIER, M. KOECHLIN, Ingrs de la Maison EIFFEL et S. SAUVESTRE, Architecte

FROM LE JÉNIE CIVIL

HELIOTYPE PRINTING CO. BOSTON

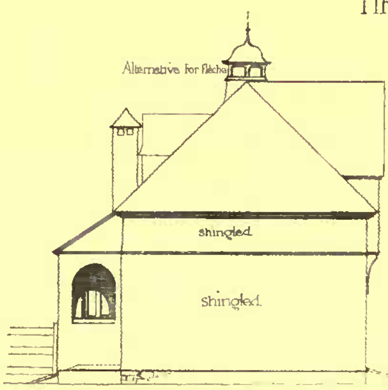


FIRST FLOOR PLAN

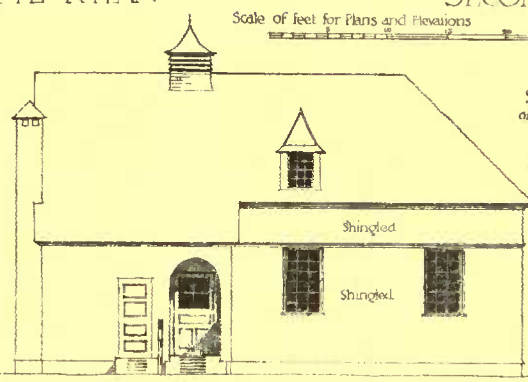


SECOND FLOOR PLAN

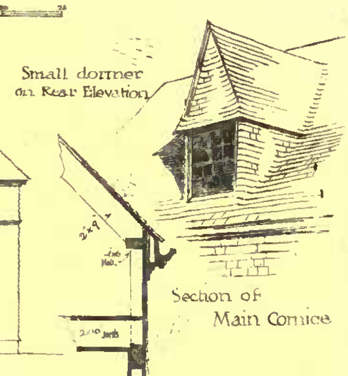
Scale of feet for Plans and Elevations



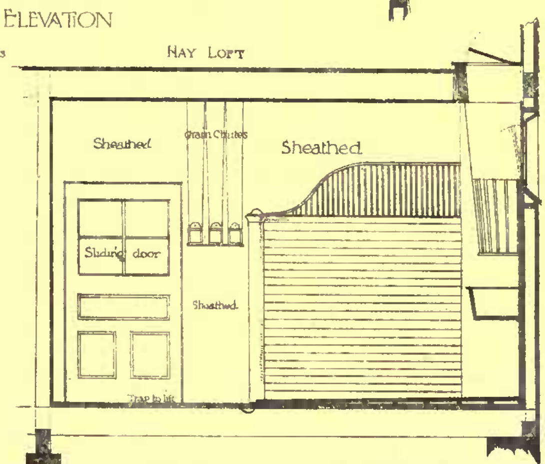
SIDE ELEVATION



REAR ELEVATION



Scale of Feet for Section through Stable and details



SECTION through STABLE

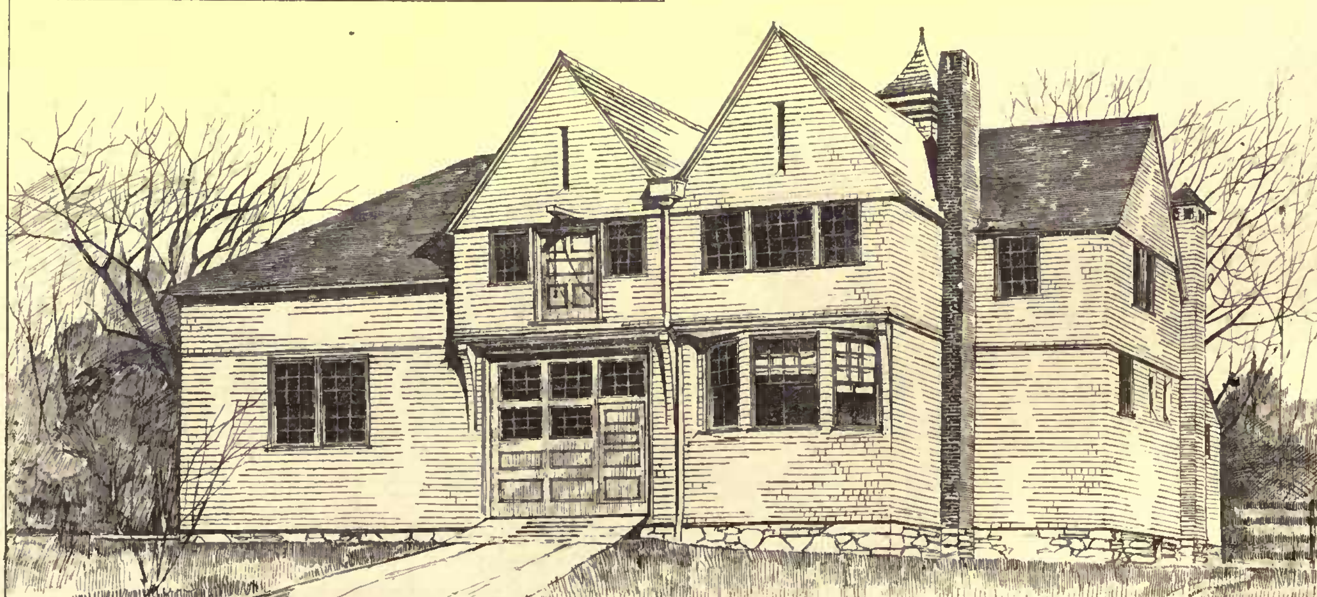
General Description of Stable:

The earth to be excavated only beneath Horse and Cow Stable where the ground will be concreted and form a manure pit This will be thouroughly ventilated by means of shingled air duct, which is carried up above roof outside the wall of Building. The frame of spruce left rough in Carriage Room, Cow Stable and Hay Loft 2nd Story. The Stable, both walls, ceiling and stall partitions to be sheathed. The Harness Room, and Man's Room, plastered. The outside wall surfaces and roof to be shingled plain; the roof shingles to be dipped in creosote stain before being laid. All finish on outside will be machine mouldings and very simple.

Estimated Cost $1474 36

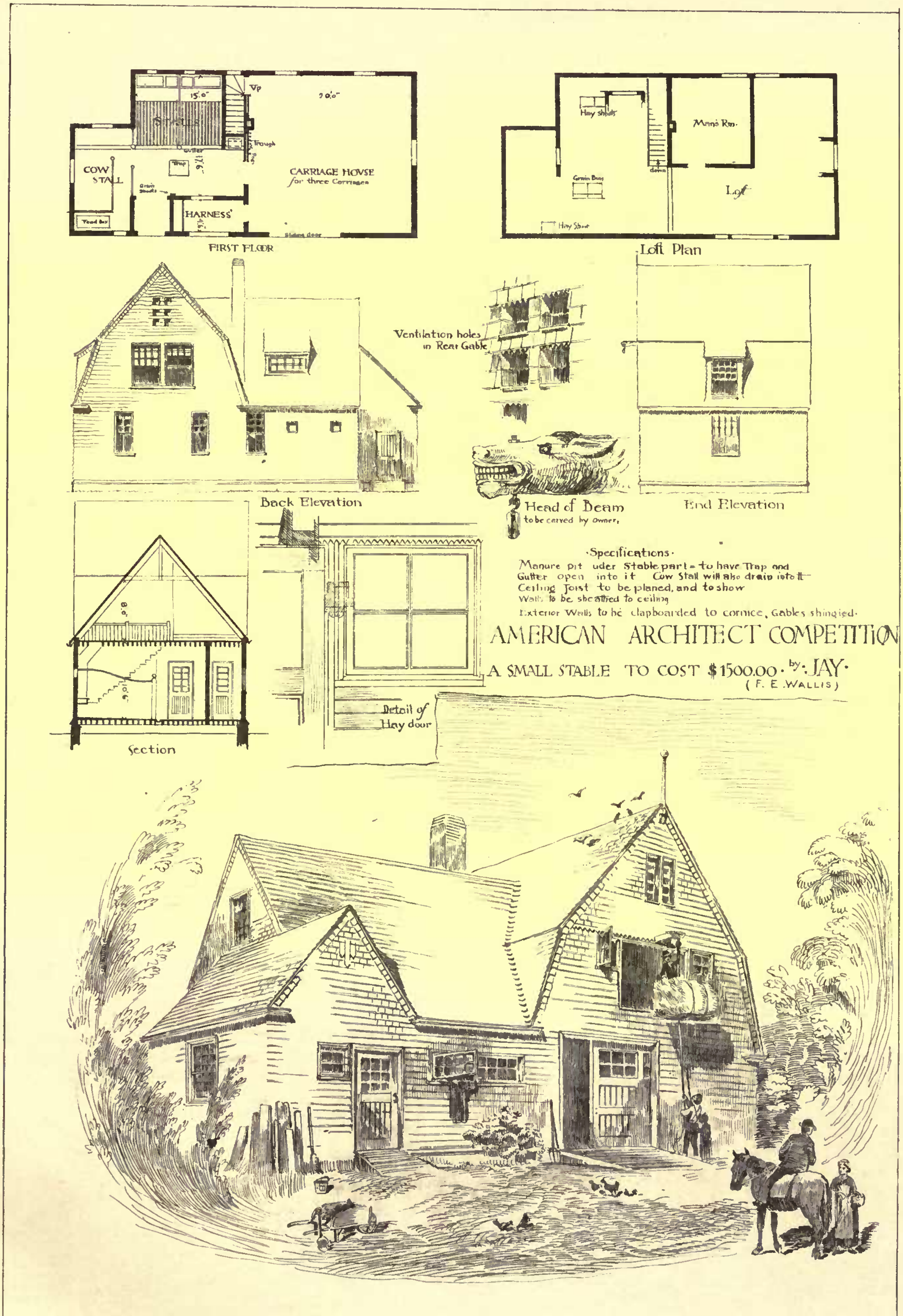
AMERICAN ARCHITECT COMPETITION for SMALL STABLE:

"DORIS" (A. H. EVERETT) to cost about $1500.



PERSPECTIVE SKETCH

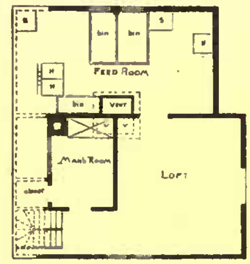
HELIOTYPE PRINTING CO. BOSTON


STALLS
15.0"
20.0"
Up
Trough
Gutter
Trap
17.6
COW STALL
Grain Shoots
HARNESS
CARRIAGE HOUSE for three Carriages
Sliding door
FIRST FLOOR
Hay shoots
Man's Rm.
down
Grain Bins
Loft
Hay Shoot
Loft Plan
Ventilation holes in Rear Gable
Back Elevation
Head of Beam to be carved by owner,
End Elevation
·Specifications·
Manure pit uder Stable part = to have Trap and
Gutter open into it Cow Stall will also drain into it
Ceiling Joist to be planed, and to show
Walls to be sheathed to ceiling
Exterior Walls to be clapboarded to cornice, Gables shingled.
AMERICAN ARCHITECT COMPETITION
A SMALL STABLE TO COST $1500.00 · by ·JAY·
(F. E. WALLIS)
8.0"
10.6"
Section
Detail of Hay door

AMERICAN ARCHITECT AND BUILDING NEWS, FEB. 21 1885 No. 478



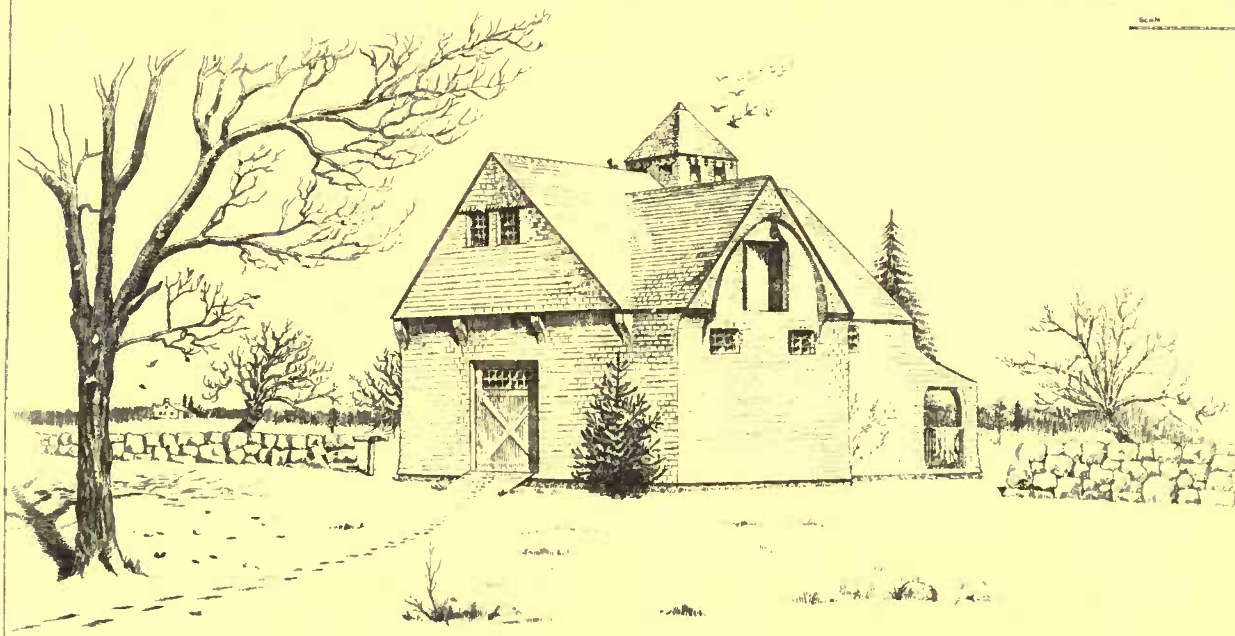
South Elevation.



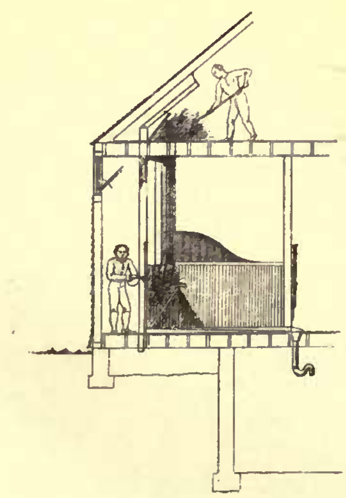
Plan of Loft.

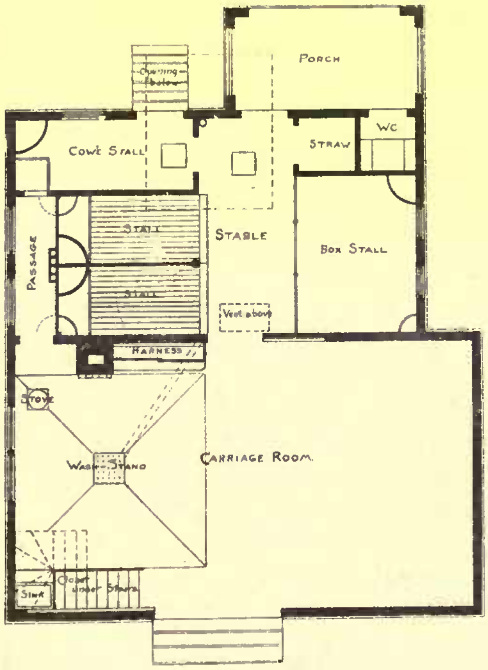


East Elevation.



Perspective View of North and West Elevations.





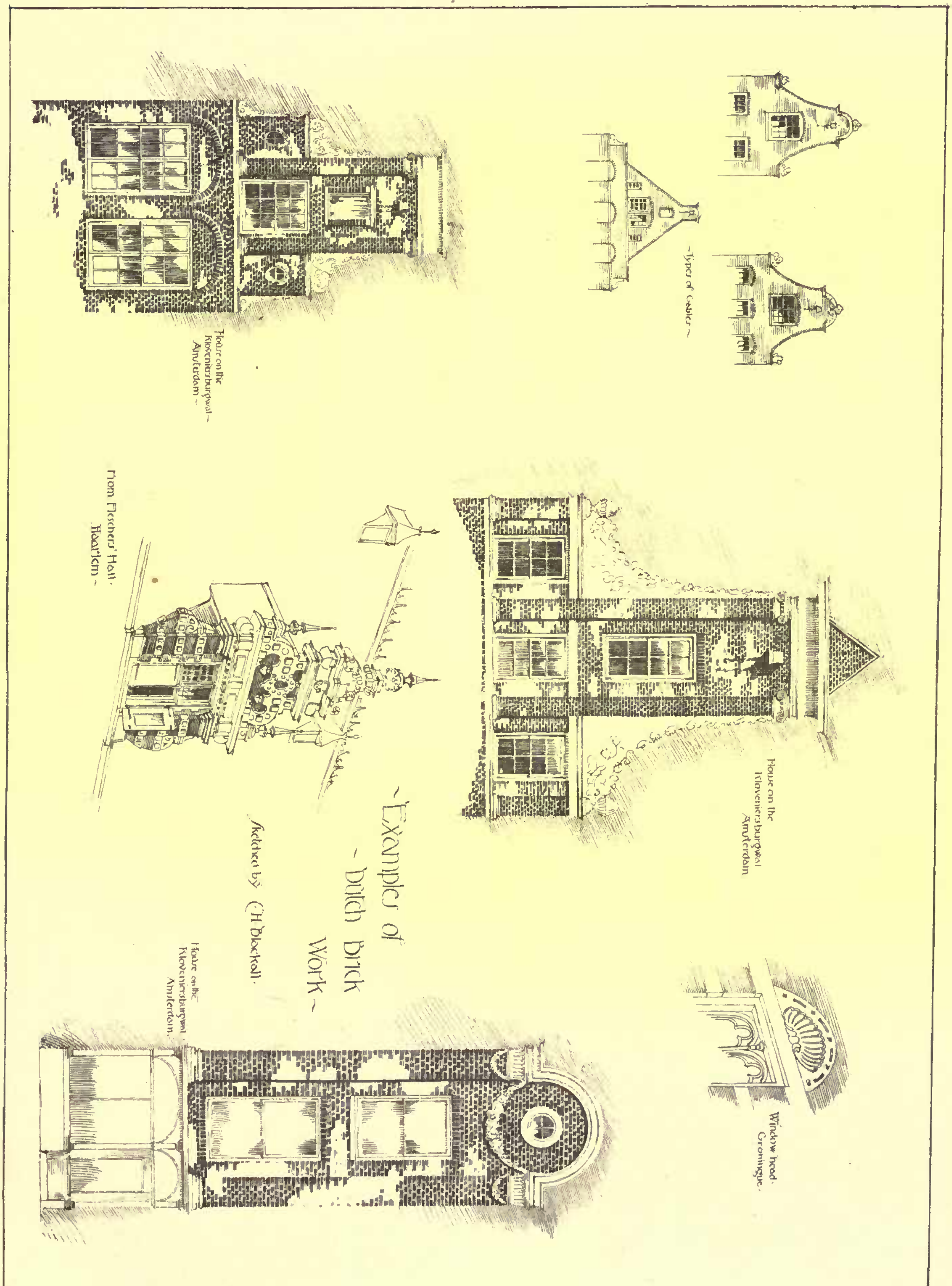
Plan of Ground Floor.

American Architect Compitition.

A Country Stable.

Design submitted by "A Country Gentleman." (T. Henry Randall)

HELIOTYPE PRINTING CO. BOSTON


House on the Kloveniersburgwal Amsterdam
Types of Gables
From Fleshers' Hall Haarlem
House on the Kloveniersburgwal Amsterdam
Examples of Dutch Brick Work
Sketched by C.H. Blackall
House on the Kloveniersburgwal Amsterdam
Window head Groninge

tower 1000 feet high. It resulted in nothing, in spite of the infatuation to which this conception had given birth in the press of the New World. Perhaps the American builders shrank from the uncertainty of such a study and the practical difficulties to be overcome in such a problem.

The most lofty monuments constructed up to this time show in short that it is difficult with materials where stone plays the principal rôle, to surpass a height of 150 or 160 metres, a maximum very rarely attained. The heights of the most lofty existing monuments are here given: —

The Cathedral of Cologne, 159 metres.
Cathedral at Rouen, 150 metres.
The Great Pyramid, 146 metres.
The Cathedral at Strasburg, 142 metres.
Cathedral at Vienna, 138 metres.
St. Peter's at Rome, 132 metres.
Flèche of the Hôtel des Invalides, 105 metres.
Panthcon, 79 metres.
Balustrade of Towers of Notre Dame, 66 metres.

Iron alone makes it possible to exceed these heights. Only metal allows of supporting the vertical reactions of the structure, and of resisting vibrations resulting from the action of the wind, which is considerable for lofty heights. It is the employment of this metal which allows the authors of the project in question to propose a monumental tower, with which they have no fear of not reaching for the first time a height of 300 metres, that is to say, a height almost double that of the loftiest monument now known.

The metallic structures which have been built in these later years reach a height of about 60 metres, and in the present state of the engineer's art, there are no very great difficulties in reaching a height of 80 or even 100 metres; but the question is quite otherwise with a height of 300 metres. There are encountered in the detailed study of this exceptional case, difficulties analagous to those which would be encountered in the study for a bridge, if one were to pass from a span of 150 metres to one of 300. In fact, to cite only a special point, if one does not wish to multiply the uprights of the skeleton of a bridge pier, he is compelled to employ diagonal straining pieces which surpass practicable limits, and which attain at the base of the pier lengths of more than 100 metres. If, on the contrary, one multiplies these uprights, we arrive at a construction extremely heavy, and with a most deplorable architectural effect. It was therefore necessary to discover a means of construction which should limit the number of the uprights, and yet should permit the separation of the diagonal braces.

It is this that has been realized in the design which we are examining. The skeleton of the tower is composed essentially of four uprights which form the arrises of the pyramid, whose faces are disposed according to a curved surface determined by the theoretical consideration of the effect of wind strains. Each upright has a square section decreasing from the base to the summit, and forms a curved latticed caisson fifteen metres square at the base and five metres at the summit. The spread of the feet of these uprights amounts to 100 metres. They are united at the upper part, and there form a platform ten metres square. The uprights are anchored to the solid foundation at different points. They are bound together by horizontal bands serving as supports to vast chambers, which could be used for the different services which are to be installed in the tower; whether for reunions, for simple amusement, or for a hygienic sojourn in the peculiarly pure atmosphere. The hall in the first story, whose floor is 70 metres above ground, has a superficial area of 5000 square metres. In the lower part of each of the faces is a large arch of 70 metres span, which forms the principal element of the decorative treatment. It gives to the tower a monumental aspect, which is indispensable for the part which it is to play. At the summit is a glazed cupola, whence can be seen an immense panorama 120 kilometres in extent, or where exact observations and scientific experiments can be conducted, as we will indicate farther on. Access would be had to this pavilion by huge elevators arranged in the interiors of the uprights, or by means of a little railroad analogous to those which ascend the slopes of some mountains in Switzerland.

Independently of the attraction and of the monumental *cachet* which this tower would present, and the daring manifestation of the prowess of the engineers of our own time, it would be susceptible of various uses which experience would make known, and among them M. Eiffel now mentions the following: —

First, strategical observations.—In event of war an observer upon this tower could perceive all the movements of the enemy within a radius of 60 kilometres, since he would overlook the heights which surround Paris, and upon which are built the new forts.

Second, communication by optical telegraphy.—In case of investment, or of the suppression of the ordinary telegraph lines, it would be possible from these elevated posts to communicate by optical telegraphy with outposts at a considerable distance from Paris, at Rouen, for instance, where a second observer could be also placed upon a high hill.

Third, meteorological observations.—An observatory established in a tower at an altitude of 300 metres would allow of a practical study, from the point of view of hygiene and of science, of the direction and violence of atmospheric currents, the state and composition of the atmosphere, its electricity, etc.

Fourth, astronomical observations.—At this grand height the purity of the atmosphere, and the absence of mists which frequently cover Paris would doubtless facilitate a certain number of observations which in ordinary times it is often impossible to make in this region.

Fifth, electric-lighting.—One of the most interesting practical applications would be that of lighting by the electric-light the Universal Exposition and a part of the city. By disposing about the tower electric generators of sufficient power, as has already been done in certain American cities, one could obtain a light of which the advantages have been known for a long time, but which have not been realized in such proportions.

Sixth, scientific experiments.—Many other applications could be realized, whether in the domain of practical affairs, as, for example, the indication of the time of day at long distances, or in the domain of science. Having for the first time at command a height of 300 metres, one could study, or could complete the studies already commenced upon many points: for instance, the fall of a body through the air; resistance of the air under different velocities; certain laws of elasticity; study of the compression of gas, or of vapors; the study of the planes of oscillation of the pendulum, etc.

Such are the main features of this vast project, to the realization of which the able and experienced engineers who have conceived it, bring a faith and an ardor of which the body of French civil engineers has a right to be proud.

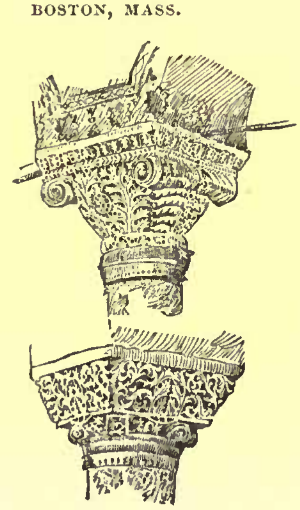
The grandest works of contemporary constructions evidently need not weigh heavily upon the hands of engineers who submit such masses of material to the strict laws of experiment and calculation, and know how to give to a work the colossal imaginativeness and material expression which scornfully reduces it, as one might say, to a simple question of money.

To this Tower of Babel of modern industry, which makes one think of the legends, one can only wish that in place of the confusion of tongues, which interfered with the execution of its Biblical ancestor, it may be built to the sound of that universal language which shall unite the people toward progress without limit, and liberty without excess. If the symbol of this dream is capable of realization, why should not the dream itself come to pass in the future? — *Max de Nausouty in Le Génie Civil.*

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

PRIZE DESIGNS FOR A $1500-STABLE. BY MR. T. H. RANDALL ("*A Country Gentleman*"), BROOKLINE, MASS.; MR. A. H. EVERETT ("*Doris*"), BOSTON, MASS.; AND MR. F. E. WALLIS ("*Jay*") BOSTON, MASS.



Capitals from the Church of St Sophia. Constantinople

THE jury enables us to publish this week the three designs to which it has been thought proper to award the three equal prizes. Two of these designs bear on their face all the description that is needed; of the third, its author furnishes the following notes: —

A square plan suggested itself as the most suitable one, both from the simplicity and economy in construction which it offered, and the convenience of arrangement.

The quarters for the horses and cow have been placed on the southern exposure of the stable, with the windows on southern, eastern and western sides. From this room a sliding-door opens to the carriage-room, and a small, common door to passage. The stable proper consists of a box-stall (7′ 6″ x 10′), two horse-stalls (4′ 4″ x 9′), the cow-stall, *entirely* separate from the horses, with its own outside door, manure-trap, hay-rack, and feed-box. This I regard as the most important feature of my plan. The horse-stalls are fitted with manger for hay, which comes from loft through chutes, as shown in section. The horses eat from below (from the manger), as is most natural, and not from above, as is usually the case, thereby saving hay which they otherwise get under their feet and over themselves. In the bottom of the manger is an opening into a "dust-flue," allowing the dust and finest hay to be swept out. The feed-box is pivoted at corner, so as to turn through a slide into passage, where it is filled from the feed-chute. From the same passage the cow is fed through a slide into her box. The floor under the stalls is laid with tongue-and-groove stuff, sloping four inches to gutter. Two coats of tar are laid upon this, and then four-inch strips, three-fourths inch apart, with upper face level, and four inches from under flooring at rear of stall. The gutter (of iron) receives the waste-water from the carriage-wash and sink, being kept cleaner thereby. Over gutter is cover of wood, as shown. Opposite cow's stall is chute and closet combined, for fresh bedding. Beyond is the *earth* closet (marked w. c. on plan) for stable.

The porch is intended for drying bedding and blankets in all kinds of weather. Under the manure-traps for cow and horses is the manure-pit, ventilated from its centre, by a five-inch drain-pipe, to four small openings above loft windows on rear elevation.

The man's room is provided with closet under eaves, etc.; a register in floor from stove below. The ventilating-shaft from stable is carried up as shown; also openings from man's and hay rooms, with doors to regulate the draft.

In ease no provision has been made for water-supply from reservoir, a large tank can be placed over man's room, under ridge, which can be filled by force-pump in carriage-room. A cistern for rain-water from roof will not be sufficient supply at all seasons, but can be depended upon for drinking water for animals.

With the aid of a practical builder, and after a careful estimate of the cost of material and labor for the construction of this stable, I have added the results of such an estimate, making the total cost $1,443, which allows a small margin for any extras.

"*A Country Gentleman.*"

Boston, December 20, 1884.

Mr. "Jay;"—

Dear Sir, — We propose to furnish the material and do the labor to complete stable as per plans for the sum of fifteen hundred dollars ($1,500).

Yours very truly, McNeil Bros.

London Monuments and Statues.—Plate III.

For descriptions, see article elsewhere in this issue.

Examples of Dutch Brickwork. Sketched by Mr. C. H. Blackall.

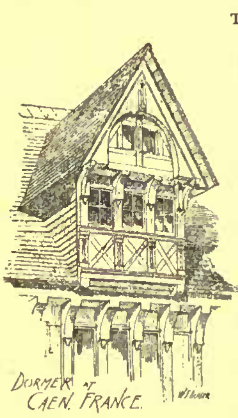
See article "A Winter Trip through Holland," in this issue.

Design for a Tower, One Thousand Feet High.

For description see article elsewhere in this issue.

THE *AMERICAN ARCHITECT* STABLE COMPETITION.

THE JURY'S AWARD.



In judging the designs the plan has met consideration first. In a stable of such small expense, a design must necessarily have but little, if any, waste room, either in ground-space, or in height of stories and roof. The harness-room should be easy of access to both carriage-room and stable. The carriage-room should allow a carriage to enter without interfering with those already in the carriage-room. The entrance of stable from carriage-room should be conveniently placed near where a horse would stand upon being driven into the stable. The disposition of chutes, racks, platforms for bedding, etc., was also considered.

Next to the plan, the general mass of the building was considered—its simplicity, harmony of motives and balance of parts. The details next met consideration, and lastly, the rendering of drawings.

The chief faults throughout were extravagance and complexity of both plans and elevations; too many corners in the first and too many motives in the second, and in most cases a nearer resemblance in the design to a cottage than to a stable. The designs selected for reward having equal awards given them and being equal in general merit, though in different particulars, are placed in alphabetical order.

"*A Country Gentleman.*"—The plan is good, but expensive; there is considerable waste room. The passage at the head of the stalls is a luxury, not a necessity, a criticism which also applies to the box-stall. The harness-case seems slight for a stable that in other ways seems so complete in its fittings, though probably it is ample. The sink should be placed nearer the stable-room. The general mass of the design is its chief virtue; it composes well from any point of view, at once taking a pyramidal form crowned by a generous ventilator, which is also utilized as a pigeon-house. The design lacks a strong base line, either formed by its underpinning or by a strong water-table, and it also lacks projection of its horizontal eaves, especially as it gets shadow in the strong bracketted treatment over the main door and in the arched verge over the hay-door. The rendering is good, but lacks strength, and is labored, especially in the accessories. Details are simple. Figures should have been omitted.

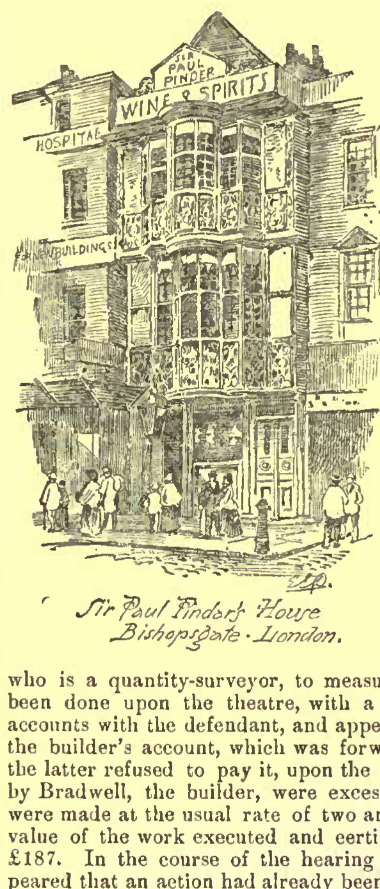
"*Doris.*"—The plan is one of the best presented: compact, with no waste room, and convenient in position of harness-room. There is but little room in the stable-room for fastening the horses while cleaning them, and as the harness-room is perhaps somewhat large for so small a stable part of it might be taken to enlarge the stable-room. This would also give better space for the grain-chutes, which are now somewhat near the horses' heels. A platform for drying bedding would be an additional gain.

The general mass of the stable is simple, except that there are too many gables for so small a structure. If the front could be restudied, and the two gables over hay-door and man's room thrown into one, and that one made interesting in its detail, the scale of the building would be improved; as it is at present the perspective gives the impression of a much larger building than is warranted by the dimensions of the plan. This is owing not only to the number of gables, but also to the small scale of the detail, and the fact that all the accessories, trees, etc., are thrown into the background and made small, which causes the stable itself to appear much larger than it really is. In the item of expense, such a number of windows would form a large factor.

The detail is simple and good: the ventilating openings in the gables should be shorter; the chimney would have been better within instead of outside the building; as shown, it would make a disagreeable perpendicular line. The alternative for ventilator is not so successful as the original design. The rendering is good—clear and direct.

"*Jay.*"—The plan is good: harness-room convenient to both stable and carriage-room; cow-stall should be entirely separated from the stable-room except that entrance should be possible from the latter. The loft is not well arranged for the storage of hay, but probably there is sufficient room. Details are simple and good. Rendering is vigorous and attractive. The eccentric sheaves of foliage which frame the perspective are of doubtful use. First-story windows in rear elevation are badly proportioned—too high for their width. The mass is simple and attractive, and the contrast of gables in sizes and shapes very successful. *For the Jury*, C. H. Walker.

THE PAYMENT OF QUANTITY-SURVEYORS.



Sir Paul Pindar's House Bishopsgate · London.

Mr. Justice Denman, sitting without a jury, in the Queen's Bench Division of the High Court of Justice, has just decided an action (Plimsaul *vs.* Lord Kilmorey) which architects, quantity-surveyors, and building-owners of property will alike do well to study. Lord Kilmorey, the owner of the St. James Theatre, engaged Mr. Verity, of Regent Street, in 1878, as an architect to carry out alterations at the theatre, and a Mr. Bradwell was, upon Mr. Verity's recommendation, employed as the builder for the work. The contract between the parties was not, in either instance, put into writing; but as the work went on, the defendant, from time to time, made payments of various amounts of money to the builder, upon certificates given by the architect. Mr. Verity, the architect, in 1879 employed the plaintiff, who is a quantity-surveyor, to measure up all the work that had been done upon the theatre, with a view to a final settlement of accounts with the defendant, and appended the plaintiff's charges to the builder's account, which was forwarded to the defendant; but the latter refused to pay it, upon the ground that the sums claimed by Bradwell, the builder, were excessive. The plaintiff's charges were made at the usual rate of two and one-half per cent upon the value of the work executed and certified by him, and amounted to £187. In the course of the hearing of the present action, it appeared that an action had already been brought by Bradwell against Lord Kilmorey for the recovery of the amounts charged by him; that the amount of the present plaintiff's charges was included in the claim then made, but that the amount had been disallowed by Mr. Dowdeswell, the official referee, to whom the action was referred, and by whom Bradwell's claim was also otherwise considerably reduced. The main question in the present action was, therefore, whether a quantity-surveyor employed by an architect, without the building-owner's directions, is entitled to be paid for his services by the building-owner for whom the architect acts, or whether his claim is against the architect alone. In support of the plaintiff's case, it was contended that by a general custom existing in the building trade, an architect has authority to employ a quantity-surveyor to measure up the work executed, with a view to a final settlement being arrived at, and that, in further pursuance of that custom, the commission payable for the survey is charged in the builder's account, and that on payment of that account the amount of the commission is handed by him to the surveyor. In order to prove the existence of the alleged general custom, the plaintiff and some other witnesses were called, and it was intimated that the plaintiff was also prepared with the evidence of other witnesses in its support; but, at the conclusion of the plaintiff's case, the learned judge gave judgment for the defendant, with costs, clearly expressing, in doing so, his opinion that a jury would hesitate to establish by their verdict the existence of such a custom. There were, his lordship pointed out, grounds

for considering it unreasonable as applied to circumstances such as those presented by the particular case before him, and it appeared, moreover, to be calculated to often prejudice a building-owner.

In the opinion thus expressed, most persons practically acquainted with the subject will, we think, fully concur, for although we are not prepared to deny that a practice such as that contended for by the plaintiff may in some instances have been resorted to, we are unable to adopt the view that it has become so general as to be entitled to be ranked or regarded as a trade custom. Nor do we think that it would be for the benefit of the building trade, or for that of architects and quantity-surveyors, that it should become so. We see many objections of a general nature to such a practice, and particular cases may present other and even stronger objections relating to their special circumstances.

One forcible objection, which is clearly apparent, is that the practice is calculated to increase, for no sufficiently good reason, the builder's responsibilities, and to complicate his relations with various persons; and another objection, equally apparent, is that it may have the effect of rendering the payment of the quantity-surveyor's commission dependent upon any arrangement for the settlement of his account that the builder may choose, or may be able to make with the building-owner. In the present case, however, putting aside the question of the validity of the custom, the evidence adduced in its support was held by the learned judge to have been displaced by the course proved to have been taken by the architect himself. With regard to this point, it appeared that before the employment of the plaintiff, communications had taken place between the architect and the defendant's solicitor, in the course of which the defendant's dissatisfaction with the builder's charges and with the amounts certified by the architect was made known to the latter. It also appeared that the architect had at the same time been informed by the solicitor of the defendant's intention to have the work measured by an independent surveyor, to close accounts with both architect and builder, and to take the work out of their hands, and that subsequently to these events a letter had been written by Mr. Verity, the architect, to the solicitor, in which he said that as the charges which he had certified for had been questioned by Lord Kilmorey, it would be well that his surveyor should go over the work with the surveyor appointed by his lordship, and that he should charge his lordship with the expenses he might incur in vindicating the accuracy of the accounts.

On being cross-examined, Mr. Verity admitted that by his surveyor he meant the plaintiff, so that it was made apparent that he employed the plaintiff as his own surveyor, in view of the differences which had arisen between himself and the defendant, and this circumstance was rendered, as Mr. Justice Denman pointed out, the more clear by the intimation — alluding to the charges which the surveyor would make for measurement — that he would charge the defendant for the expenses which he might incur; an intimation which would not only have been unnecessary, but also groundless in the face of the custom sought to be established, had there been any substantial reason for treating the employment as being that of the defendant, and not that of the architect himself. It was, moreover, admitted by one of the plaintiff's principal witnesses, in answer to a question put by the learned judge, that the fact of a dispute having arisen between a building-owner on the one side and his architect and builder on the other, would make a difference in the operation of the custom above referred to — an admission which would seem both to indicate that, even if it existed, it would be inapplicable to the circumstances of the particular case, and that its observance was so far uncertain and wanting in general application as to seriously impair the validity claimed for it.—*Building News.*

PERSUASION, NOT COERCION, A CURE FOR THE EVILS OF MODERN COMPETITION.

BOSTON, February 15, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,— "What are you going to do about it?" says Mr. Illsley, quoting Boss Tweed, in your last issue. I can tell him: talk; nothing more than that. In your "open letter" you offered architects a chance of *doing* something, but what came of it? It was referred to the Board of Trustees of that amiable and sedate body, the American Institute of Architects, who believed the subject, "as brought forward in the open letter," "an important one," and showed how important a matter they thought it by asking the opinion of just *one hundred* architects outside the charmed circle of their membership, which it seems amounts to one hundred and seventy-seven. The chance of doing or saying something on this "important" subject was, then, offered to perhaps ten per cent of the practising architects of the country. Can any one wonder that the architects in the West thought it was about time to have a new association, which would do something other than merely oil its machinery once a year? If this new association will do something to justify its existence, by doing or trying to do what the American Institute of Architects seems to find outside of its rut, I believe that even members of the Institute itself will applaud, and, as individuals, lend their assistance.

As to this matter of competitions, I hold that the attitude of the profession is at once unmanly and insincere. Unmanly, because there is so much lamentation over it, and insincere, as Mr. Illsley proved by his tale of the way St. Louis architects disregarded their pledges when brought face to face with self-interest.

It is the constant cry that the public abuses and takes advantage of the weaknesses of the profession as no other profession would endure, and Mr. Illsley scouts at the idea of lawyers entering into unpaid competitions. I admit that architects and allied artists are the only ones who do enter into competitions, but my belief is that the motives that influence them would influence other professionals, were the chance offered. Suppose an advertisement to appear in the papers to-morrow, announcing that a valuable estate was to be settled, and that various intricacies would attend it which would be made known on application, and that any lawyer who by a certain date should present the best scheme of settlement should have the job and receive the usual percentage which lawyers charge for settling an estate. Can any one for a moment doubt that the relative number of competitors would not be as great as the legal profession is more numerous than the architectural? So with doctors, suppose the prize to be competed for were the headship of a hospital. Clergymen already compete, by showing their paces before the congregation from which they hope to receive a "call." It is not fair to contrast the behavior of one profession with that of another, unless the conditions under which they are to be compared are made somewhat analogous.

No: architectural competition is legitimate, and all this outcry is illogical and unmanly — just what one would expect from the "soft-handed" ones Mr. Sedding makes so much fun of. The key to the matter is that architecture concerns matters of taste, and matters of taste, rightly or wrongly, concern every one, the public quite as much as the architects. To say that the proper way to obtain a satisfactory design for your own house or your own town-hall is to entrust it to the skill of some "well-known architect," is to preach rank nonsense. It is a matter of taste that is to be satisfied. Whose taste; the well-known architect's, or your own? You want a suit of clothes and you usually trade with a "well-known" tailor, so you go to him; but if he does not happen to have the goods you want, do you let him make up a suit out of goods that do not please you, or do you hunt up another and another tailor until you are satisfied? Of course you do this last, and what is this but compelling these several tailors to enter a competition to meet the requirements of your taste? It would be as unmanly for the tailors to raise an outcry and say that it wasn't just to expect them to carry a line of goods unless they unfailingly meet the taste of every comer, as it is for architects to whine because the public expects them to exhibit *their* line of goods before selection. It is as much the right of every man or body of men to "pick and choose" in the matter of a design for a building, as in the selection of their Thanksgiving turkey.

Any architect who nowadays takes part in a competition generally does so after a full knowledge of the special conditions, and a general knowledge of what the results usually are, and a self-respecting and manly man should take his discomfiture in good part, acknowledging that competition is the law of life, and not raise this continuous wail, which does more harm to the profession than any other one thing, as it lowers the dignity of the manhood of all who bear the name. These scrambles are generally as bad as bad can be, unjust in their conditions and unfair in their operation, but they cannot be bettered by talk alone. The American public understands a bargain thoroughly, and it is not to be blamed for offering the sharpest one it can devise; but as it takes two to make a bargain, the fools who accept the proffer have little claim to sympathy, for the terms would have been changed, without a doubt, if there had been no takers.

The public is as human as any body who is not in search of a design, and it resents any attempt to coerce it, particularly in matters of taste. Hitherto all attempts at effecting a better routine have been coercive in their nature, and it occurs to me that a change is more likely to be effected by persuasive measures than by steps compulsory. The only suggestion I can offer is one which would require much self-devotion to carry out, — but there may be something in it.

Suppose an invitation containing the usual restrictive clauses and insulting stipulations which debar self-respecting architects from touching the thing to be issued to-morrow. The chances are good that the party signing the call would receive from a dozen "well-known" architects remonstrances, homilies and essays pointing out the monstrosity of his presumption. Now instead of this, suppose a dozen or more well-known architects should band together and write to the offending party, saying, "Dear sir, we, who are severally the architects of the following well-known structures, cannot take part in your competition under its present unprofessional conditions; but if you will modify them so that they shall read thus and so, we will all then take part, and do our best work for you to choose from. Consider whether it is not for your advantage to select from the work of twelve men like ourselves — to say nothing of all the others — than to have us and all like us, of attested ability, refrain from aiding you." This is Quixotic, no doubt, but it would unquestionably be effective, and would not need to be continued many times. The public knows a good thing when it sees it, and just so soon as it is proved that their way is not the best for them, they will abandon it.

There is of course no chance of such a scheme being carried out if it is to be left to the unsupported philanthropy of a few individuals, but if the profession at large will take it up and support these dozen or more "well-known architects," by each contributing a dollar or so, a fund could be easily raised each time which should,

when divided amongst the twelve or more champions of reform, fairly reimburse them for the outlay of thought and time expended for the common good of professional advancement.

Until some such attempt at persuasion as this has been made, the last word in the matter of competitions has not been said, and all complaints and repinings are premature. At any rate, if you architects of this country will not *do* anything to help yourselves, for Heaven's sake don't whine about it.

Very truly yours, W.

[This scheme, if properly supported, might effect what our correspondent hopes. Now, who will support it, either with hand or purse? If there be more virtue in deeds than in words here is a chance to discover.—Eds. American Architect.]

PLANS FOR A TURN-HALL.

Chicago, Ill., January 23, 1885.

To the Editors of the American Architect:—

Dear Sirs,—Will you please be kind enough to describe a practical ground-plan for a gymnastic hall (Turner Hall) if possible? The membership is from 300 to 400. Hoping to receive an answer.

Yours respectfully, John Neebe.

THE HISTORY OF ROMAN ARCHITECTURE.

Burlington, Io., February 12, 1885.

To the American Institute of Architects:—

Dear Sirs,—Please inform "Roman" through your valuable paper that the greatest and most exhaustive work upon Roman architecture, is by Lugra Canini, the great commentator. Thirty volumes, price about three thousand dollars, published in the Italian language only. The writer thinks that by the time "Roman" of Denver, has got as far as the end of the last volume, he will be the best posted architect on Roman architecture in America. C. A. Dunham.

KEENE'S CEMENT.

New York, February 10, 1885.

To the Editors of the American Architect:—

Dear Sirs,—Will you allow us to correct a slight error in your reply to a correspondent, in your issue of February 7, asking for information respecting Keene's Cement. You speak of the pure whiteness of the *coarse*, and infer that the superfine is *not* so white. As a fact (and the samples of the respective kinds are before us as we write), the superfine is of a pure marble white appearance, and the coarse is of a slight pinkish hue. Yours respectfully,

S. L. Merchant & Co.

NOTES AND CLIPPINGS.

Water-Blasting.—The value of water as an aid to blasting when used in connection with explosives is rapidly becoming recognized in this country, as well as in the larger mines and quarries of Europe. Ordinary blasting with gunpowder in coal mining is done by boring a hole in the face of the coal about two inches in diameter and four or five feet deep. Into this is inserted the powder cartridge, together with the slow fuse, when the hole has been well tamped, filled with any dry refuse rammed in tight, then fired by lighting the fuse. In this operation (and we have described it thus not to show any new ideas connected with it, but for comparison) a very dangerous flame, especially in gaseous pits, is created, and appalling results often ensue; carbonic acid and sulphurous acid gases are generated, very dangerous to miners and to mining properties. When it is desired to blast with water together with gunpowder, the process is conducted by inserting into the bore-hole a powder cartridge with the fuse attached as in the ordinary way; next to the powder cartridge is inserted into the bore-hole a tube containing water. These tubes must be as large as the bore-hole will admit, and of any length convenient to handle, the larger the better; they may be made of any cheap material convenient, cheap thin tin plate, or stout brown paper turned around on a wooden roller, after being well pasted together, the ends closed with corks. The bore-hole is now tamped in the ordinary manner, the fuse lit and the cartridge fired in the usual manner. As a result of this process the following points of excellence, among many others, may be briefly mentioned: the powder, in exploding, bursts the tube containing the water, and, careful estimates show, with increased power or explosive violence, as the rending force is extended through the water in accordance with the well-known principle of hydrostatics practically demonstrated years ago by Bramah, over the enlarged interior area of the bore-hole, due to the space occupied by the water tube. A much larger quantity of the material to be mined or quarried is thereby brought down or loosened with a smaller quantity of the explosive used. The heat given off by the burning of the powder and surrounding gases converts a larger proportion of the water into steam, the elastic force of which assists in the operation of blasting; the steam and remaining water together extinguish the flame and flash of the powder, and absorb and neutralize the greater portion of the gases and smoke resulting from the explosion. It will readily be seen that by this process are met together economy, power and safety, the system being simple and effective and not attended with anything inconsistent with the well-known laws of explosion. It is to be hoped that, in the best interests of humanity, our large and intelligent body of miners and quarrymen will not be slow to adopt an amelioration in the present crude and dangerous processes of blasting, which will tend, in no small measure, to render premature explosions in mines a thing of the past, rather than one of almost daily occurrence.—*Coal Trade Journal.*

A Forest tree in Georgia was recently cut down at six o'clock in the morning, made into pulp at a factory, and into paper at six o'clock in the evening, and at six o'clock next morning was distributed as a printed newspaper.—*Journal of Progress.*

An Icequake.—Madison had a tremor, on Friday, January 23, which was due not to a social or other earthquake, nor yet to a dynamite explosion. A disturbance which shook the university buildings was caused by the expansion and contraction of ice in Lake Mendota. Under the influence of intense cold the ice had expanded until the shores could resist the pressure no longer, when the ice burst and doubled up about four hundred feet from the shore and on a line parallel with it. The sudden release of the shores from pressure caused the tremor. This phenomenon of freezing upon bodies of water having low shores frequently results in the pileing up of huge rocks on the edge and the overturning of trees. The shore line of lakes frequently consists of gravel mounds forced up during successive winters.—*Milwaukee Wisconsin.*

Death of Mr. Samuel Huggins.—We regret to announce the death of Mr. Samuel Huggins, whose writings on architectural topics will be familiar to the readers of the professional journals. Mr. Huggins was educated for the architectural profession, but seems to have abandoned the practice of it for writing about it. His papers, read before learned societies, and contributed to this and other journals were very numerous, and he was one of the first and staunchest opponents of the destructive nature of the church restoration movement. He was the author, also, of a "*Chart of the History of Architecture,*" which was first published in the *British Architect.* One of his latest literary efforts—indeed we believe his last—was the publication, in our "Friends in Council" series, of his opinions as to the style, etc., of the proposed Liverpool Cathedral, on the 26th ult. And it is a remarkable testimony to his vital energy and indomitable perseverance that even on his death-bed he should feel it incumbent upon him to write us, apologizing for the non-fulfilment of a promise made a week or two since. That letter reached us the day but one before he died. In it he spoke of the apparent hopelessness of his recovery and of the work left unfinished. Mr. Huggins was born at Deal, in Kent, in 1811.—*British Architect for January* 16.

Work of the New York Department of Public Works.—The report of the Department of Public Works for the year ending December 31 last was yesterday sent to the Mayor. The expenditures for the year were $4,644,997.37. Of this sum $2,716,287.38 was expended on appropriation account, $956,823.91 on assessment fund, street improvements; $918,610.31 on funded debt, water supply, and $53,275.77 on trust funds, for meters and pavements. The rainfall in the Croton watershed for the year was 53.71 inches, which since 1865 has only been exceeded in 1878 and 1882. Still there were several periods of extreme dry weather, when 2,040,000,000 gallons of water had to be drawn from the two storage reservoirs and several lakes to supplement the natural flow of the Croton River, so as to keep the aqueduct fully supplied. All the reservoirs and lakes are now full. A water-supply of about 10,000 gallons per day is now received from the Bronx River. The works are completed, except the receiving-reservoir at William's Bridge. The total length of water-pipes now in use is 562.9 miles, with 5,960 stop-cocks and 7,400 fire hydrants. The average quantity of water supplied per day through 10,905 meters is 20,060,600 gallons. The excessive waste of water which occurs in freezing weather through the habit of letting the water run from faucets day and night, to prevent freezing in the pipes, is shown by the fact that on a single cold day, December 20, the Central Park reservoir was drawn down five inches, showing a waste of 13,000,000 gallons on that day over the usual consumption and over the supply received from the aqueduct. The department collected during the year $1,985,329.32 for water, and $143,063.38 for vault and sewer permits and from other sources.—*New York Times.*

Khartoum.—Khartoum, the chief city as well as the capital of the Soudan country claimed by Egypt, is about fifteen hundred miles from Cairo. It stands on the peninsula formed by the junction of the Blue and the White Nile. The dock-yards and principal landings are on the Blue Nile. The water in the river is about fourteen hundred feet above the level of the sea. There is an extensive quay on the banks of the river, where the principal commerce of a country as large as all India naturally centres. The provinces of the Soudan are not commercial to any great extent, but these great rivers bring to this point a large number of ships. The principal productions are ivory, hides, senna, gum-Arabic and beeswax. The inhabitants of that vast country are notoriously indolent, and some one has said that bees are the only industrious creatures in the whole country. A great part of the city lies low, so that at high water it is flooded, rendering it unhealthy; but it is believed that some day a remedy for that evil will be provided. The gardens around the city are extensive and contain long rows of date-palms, many of which are half a century old and have become very valuable. The climate is severe. From June till October the thermometer ranges from 95° to 100° in the shade, and is about 80° in winter during the daytime. The city was founded by Mohammed Ali in 1823, and at the opening of this century only a few fishing huts marked its site. In 1859 the population was estimated at fifty thousand, but in the next ten years the disturbed state of the country brought the number down to fifteen thousand. Since then, however, there has been a marked recovery, and of late the population has been about fifty thousand. The town, though consisting chiefly of mean, mud-built huts, has a number of substantial modern dwellings, the most imposing of which is the stone-faced palace of the governor, in which Gordon took up his abode. The Christian population is very small, but Khartoum is the seat of a Roman Catholic mission which was established by Pope Gregory XVI, in 1846. Protestant missions were long conducted by Prof. Ignaz Knoblecher. Several European consulates are established there.—*Springfield Republican.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

311,872. SASH-HOLDER. — Norman Clark, Sterling, Ill.
311,891. ILLUMINATING-TILE FOR SIDEWALKS, ROOFING, ETC.—Charles E. Furman, New York, N.Y.
311,892. WRENCH. — John Gibbons, West Troy, N.Y.
311,895. MANUFACTURE OF HYDRAULIC CEMENT.—David Griffiths, Egypt, Pa.
311,911. COMBINED DRAWING-SQUARE AND MITER.—John Müller, Kansas City, Mo.
311,929. WEATHER-STRIP. — Theophilus Weaver, Harrisburg, Pa.
311,938. PAPER FOR ROOFING FELT, ETC.—Charles W. Armour, Summit, N. J.
311,939. PAPER FOR SHEATHING, ETC. — Charles W. Armour, Summit, N. J.
311,982. WATER-CLOSET APPARATUS HANDLE. — Joseph H. Hawley, Danbury, Conn.
311,992. LOCK.—Andreas Kohlhof, New York, N.Y.
312,003. FIREPLACE HEATER. — Gardner L. Morrison, Brooklyn, N. Y.
312,005. WINDOW.—James W. Naughton, Brooklyn, N. Y.
312,012. FILE-HOLDER.—William H. Phelps, Stamford, Conn.
312,023. COMBINED SASH-FASTENER AND LIFT. — Frederick W. Seymour, Newark, O.
312,024. TRANSOM-LIFTER. — John H. Shaw, New Haven, Conn.
312,025. SASH-CORD GUIDE. — David Shealy, Bucyrus, O.
312,051. WINDOW-BLIND SLAT. — Henry E. Willer, Milwaukee, Wis.
312,052. WINDOW-FRAME. — Henry E. Willer, Milwaukee, Wis.
312,053. WINDOW-SHUTTER.—Henry E. Willer, Milwaukee, Wis.
312,057. COMPOSITION FOR THE MANUFACTURE OF ARTIFICIAL STONE.—James L. Wray, Watseka, Ill.
312,076. AUTOMATIC FIRE-ESCAPE. — Frank A. Bone, Lebanon, O.
312,077. WATER-COCK.—Philip A. Bowen, Milwaukee, Wis.
312,120. CUT-OFF FOR CISTERNS.—John S. Heaton, Shelbyville, Ky.
312,127. DOOR-CHECK. — Thomas M. Kenney, Cambridge, Mass.
312,143. FIRE-FRONT. — Patrick McCauley, Braddock, Pa.
312,175. PERSPECTIVE DELINEATOR FOR DRAUGHTING.—William E. Spier, Augusta, Ga.
312,177. VENTILATOR.—John M. Ayer, Chicago, Ill.
312,222. ILLUMINATING - TILING. — Christian H. Ross, Chicago, Ill.
312,224. TRANSOM - OPERATOR. — Sutton Strong, Harmony, Ind.
312,229. PLANE.— William Tidgewell, Middletown, Conn.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report ten permits have been granted, the more important of which are the following: —

A. Beckenheimer & Bro., three-st'y brick building, n s Stiles St., e of High St.

D. Gotto, three-st'y brick building, w s East St., n of Baltimore St.

Boston Fear, 6 three-st'y brick buildings, w s Mount St., s of Edmonson Ave.; and 6 two-st'y brick buildings, s s Caiso Alley, w of Mount St. and s of Edmonson Ave.

Boston.

PUBLIC BUILDINGS.—The annual report of the Superintendent of Public Buildings states that: —

The public buildings in charge of this department belonging to the City of Boston, number 322, together with 11 leased buildings, variously occupied for city purposes. The City Hall is occupied entirely by the various departments and offices of the city. The Fire Department requires for its service the use of 58 buildings. The buildings in use by the Police Department number 18, 14 of which are in use for police-station houses, and the remainder for lock-ups. Public Library accommodations are paid for by this department for buildings hired in South Boston and Roxbury. The above-mentioned buildings occupy 1,284,919 square feet of land, and their assessed value is $7,800,000. The school-houses owned by the city number 168, occupying 2,923,922 square feet of land, the valuation of land and buildings being $8,600,000.

In addition 14 buildings are leased for school purposes at an annual rental of $5,520, and containing 23 school rooms. The expenditures for repairs, alterations, improvements, heating, furnishing, care and cleaning, have been as follows: public buildings, $147,859.90; labor and material in the removal of the Beacon Hill reservoir, $13,670.87; county buildings, $42,620.19; school-houses, $193,263.94.

BUILDING PERMITS. — *Wood.* — *Sargent St., No.* 27, dwell., 22′ x 30′; A. P. Clifford, owner and builder.

Sargent St., No. 21, dwell., 22′ x 30′; A. B. Clifford, owner and builder.

Orchard Pl., near Boston St., dwell., 23′ x 30′; Susan Eadie, owner; William Eadie, builder.

Parker St., No. 729, dwell., 30′ 6″ x 35′; Jacob Goldsmith, owner.

Parker St., No. 731, dwell., 25′ x 40′ 6″; Jacob Goldsmith, owner.

Zeigler St., No. 111, dwell., 21′ x 58′; J. H. Waite owner; William Morse, builder.

New Seaver St., No. 30, dwell., 29′ x 31′; A. M. Leonard, owner; C. H. Wetmore, builder.

Erie Ave., cor. New Seaver St., dwell., 27′ x 38′; A. M. Leonard, owner; C. H. Wetmore, builder.

Erie Ave., near New Seaver St., dwell., 29′ 9″ x 40′; A. M. Leonard, owner; C. H. Wetmore, builder.

Atherton St., near Washington St., dwell., 21′ x 52′; F. W. Kittredge, owner.

Brooklyn.

BUILDING PERMITS.—*Van Buren St.*, n s, 100′ w Stuyvesant Ave., three-st'y brick building, m'f'g purposes, gravel roofs; cost, $5,000; owners, Wm. Nagle and R. W. Homan, 217 Hooper St. and 91 Stuyvesant Ave.; architect and carpenter, Wm. H. Doughty; masons, James Ashfield & Son.

Graham Ave., No. 426, e s, 100′ n Withers St., four-st'y frame (brick-filled) store and tenement, tin roof; owner, Augustus Weingardt, 428 Graham Ave.; architect, Th. Engelhardt; builder, Andrew J. Hulse.

Steuben St., e s, 85′ s De Kalb Ave., 10 four-st'y brown-stone flats, tin roofs; cost, abt. $12,000 each; owner, Thomas R. Brush, cor. Fourth St. and Flatbush Ave.; architect, Fred E. Lockwood.

Halsey St., s s, 115′ e Sumner Ave., 12 two-st'y brick dwells., felt, cement and gravel roof, wooden cornice; cost, $3,500 each; owner, George R. Waldron, 529 Halsey St., architect, Amzi Hill.

Cedar St., No. 52, s s, 193′ e Evergreen Ave., three-st'y frame flat, tin roof; cost, $3,000; owners, C. & G. Spoerl; architect, Th. Engelhardt.

Powers St., No. 259, n s, 125′ e Judge St., three-st'y frame tenement, tin roof; cost, $4,000; owner and architect, Herman Meydrott, on premises; builders, C. Buchheit and D. Kreuder.

Fulton St., s w cor. Boerum St., two-st'y and attic oolitic stone hall of records, tin roof; cost, $275,000; owner, Kings County; architect, W. A. Mundell; builders, P. J. Carlin and L. W. Seaman, Jr.

Somers St., n e cor. Rockaway Ave., 14, cor. three-st'y, others two-st'y, brick store and dwell., balance dwells., felt and gravel roofs; cost, cor., $4,000; others, $2,000 each; owner, George R. Brown, 34 South Portland Ave.; builder, L. E. Brown.

Marion St., s e cor. Hopkinson Ave., 6, 3 two-st'y and 3 three-st'y frame dwells.; cost, abt. $2,000 and $3,000 each; owner, Geo. W. Lung, 20 Utica Ave.; architect, Chas. E. Hebbard.

Bergen St., Nos. 51 *and* 53, three-st'y brick carriage repository, tin roof; cost, $6,000; owners, Messrs. Linn Bros., 47 and 49 Bergen St.; architect, C. F. Eisenach; builders, T. J. Nash and I. B. Jacobs.

Palmetto St., n s, 125′ w Knickerbocker Ave.; 3 two-st'y frame dwells., tin roofs; cost, total, $6,000; owner, F. C. Feldmann, 20 John St., New York; architect and builder, R. Ferguson.

Magnolia St., s s, 300′ e Knickerbocker Ave., three-st'y frame store and tenement; cost, $4,200; owner and architect, Charles Kretschmar, 310 Franklin Ave.; builder, E. Hendrickson.

ALTERATIONS. — *Bridge St.*, e s, 200′ n Myrtle Ave., repair damage by fire; cost, $3,000; owner, Trustees of E. M. Church; builder, T. A. Remsen.

Chicago.

THE OLD CITY HALL.—The City Council has decided to lease the old city-hall property to Henry S. Everhart, for a period of ninety-nine years. He agrees to pay $30,000 a year for it, and to erect on the lot a building to cost $500,000 or more. Everhart is to take possession of the property March 1, 1885. It is also provided that there shall be a re-valuation each twenty years, and upon such re-valuation the annual rent shall be based at the rate of six per cent provided that such re-valuation shall not be a less sum than shall yield to the city an annual rental for the premises of not less than $30,000.

BUILDING PERMITS.—S. H. Wheeler, 10 two-st'y stores and dwells., 1333-1351 West Lake St.; cost, $18,000.

J. L. Campbell, 24 two-st'y dwells., Western Ave.; cost, $72,000; architects, Edbrooke & Burnham.

C. Braubigam, three-st'y dwell., 253 West Huron St.; cost, $4,300; architect, H. Kley.

S. Taylor, 2 two-st'y flats, 207-209 North Oakley St.; cost, $5,000; architect, G. C. Garnsby; builder, Chas. Holman.

H. W. Martin, 5 three-st'y flats, 1701-1711 Dearborn St.; cost, $11,000.

New York.

THE INSPECTOR OF BUILDINGS. — The appointment of Mr. Albert F. D'Oench as Inspector of Buildings will result in the issue of a number of permits to build. There is a large accumulation of applications.

THE BUILDING BUREAU. — Inspector William P. Esterbrook, of the Bureau of Buildings, has presented his report for last year to the Fire Commissioners. It shows that during the year plans were filed for the erection of 2,912 buildings, of which 1,013 were for tenements and 182 flats. There were only four private dwellings, at a cost exceeding $50,000 apiece. The total estimated cost for all buildings was $41,461,208.

There were filed plans for 2,463 alterations, at a total estimated cost of $4,659,532. The Bureau investigated 2,073 complaints, and dealt with 7,851 violations of the building law. In 5,103 of these cases the detects were remedied without carrying the matter to the courts.

In the last sixteen years plans were filed for the erection of 34,907 buildings, at a total cost of $509,961,484.

APARTMENT-HOUSES. — On the s w cor. of Fifth Ave. and Thirty-fifth St., a co-operative apartment-house, 85′ 9″ x 146′, is to be built at a cost of about $600,000, from designs of Mr. Chas. C. Haight.

On the n s of Fifty-seventh St., between Eighth and Ninth Aves., a seven-st'y apartment-house, 50′ x 90′, of brick, stone and terra-cotta, is to be built by Mr. Philip Braender, from plans of Mr. John Brandt.

HOUSES. — On the n s of Seventy-third St., w of Park Ave., Mr. John Prague, the architect, will have erected for his own account 5 four-st'y and basement dwells., 17′ 7″ x 80′ each, brick, stone and terra-cotta fronts; cost, about $100,000.

STORE. — At No. 478 Pearl Street, Mr. Thos. R. Jackson, the architect, will have built a six-st'y and basement store-building, of brick and stone, adjoining his structure erected last year.

OFFICE AND STORE BUILDING. — Messrs. Ottmann, Keppler & Schwarzmann have now decided to build the *Puck* Building on the s w cor. of Houston and Mulberry Sts.; the fronts will be of brick, stone and iron, and the cost of the structure about $200,000; Mr. Albert Wagner is the architect.

BUILDING PERMITS. — *One Hundred and Forty-fifth St.*, n s, 173′ e Third Ave., two-st'y brick dwell., tin roof; cost, $3,000; owner, Geo. J. Ord, 606 East One Hundred and Forty-fifth St.; architect, John Rogers.

Alexander Ave., s e cor. One Hundred and Thirty-seventh St., 7 three-st'y brick dwells., tin roofs; cost, each, $6,000; owner, Frank G. Swartout, 353 East One Hundred and Twenty-fourth St.; architect, Wm. J. Merritt.

Ave. A, e s, 75′ n Eighty-fourth St., 3 five-st'y brick tenements and stores, tin roofs; cost, each, $13,500; owner, Frank White, 2425 First Ave.; architect, John Brandt.

Fulton St., No. 242, five-st'y brick tenement and store, tin roof; cost, $16,000; owner, Henry Lemmermann, Brooklyn; architects, A. Pfund & Son.

One Hundred and Fiftieth St., n s, 100′ w North Third Ave., 2 frame tenements, tin roofs; cost, front, $4,800 and rear $2,000; owner, Louis L. Zugner, 633 North Third Ave.; architect, A. Arctander.

West Fifty-first St., No. 529, five-st'y brick and stone tenement, tin roof; cost, $14,000; owner, Henrik G. Folkman, 798 Tenth Ave.; architect, J. W. Cole; builder, J. Jordan.

St. Mark's Pl., No. 11, five-st'y brick tenement, tin roof; cost, $18,000; owner, John Kreusser, 1258 Lexington Ave.; architect, J. Kastner.

Eighty-fifth St., s s, 235′ 6″ e Fourth Ave., six-st'y brick flat, tin roof; cost, $35,000; owner, Philip Braender, Ave. B, between Eighty-fourth and Eighty-fifth Sts.; architect, John Brandt.

One Hundred and Fifty-second St., s s, 175′ w Courtland Ave., two-st'y frame dwell., tin roof; cost, $3,400; owner, Ferdinand Geyer, 601 Courtland Ave.; architect, Adolph Pfeiffer.

One Hundred and Fifty-second St., s s, 200′ w Courtland Ave., two-st'y frame dwell., tin roof; cost, $3,400; owner, Nicholas Jesbera, 562 East One Hundred and Fifty-first St.; architect, etc., same as last.

Willis Ave., w s, 25′ n One Hundred and Forty-fourth St., 4 four-st'y brick tenements, tin roofs; cost, $15,000 each; owner, Patrick Nolan, 954 East One Hundred and Thirty-eighth St.; architect, Chas. Baxter.

Third Ave., w s, 70′ 8″ n One Hundred and Second St., 3 four-st'y brick tenements and stores, tin roofs; cost, each, $8,500; owner, John J. Worden, 6 West Third St.; architects, D. & J. Jardine.

Lexington Ave., No. 1884, four-st'y brick tenement, tin roof; cost, $10,000; owner, John Banoon, 74 East One Hundred and Twenty-first St.; architect, Alfred Chamberlain.

Seventy-sixth St., s s, 150′ w Ave. A, five-st'y brick tenement, tin roof; cost, $15,000; owners, Jos. and Thomas Farrell, 35 Sutton Pl.; architects, A. B. Ogden & Son.

West Twenty-first St., Nos. 513, 515 *and* 517, three-st'y brick workshop, tin roof; cost, $3,500; owners and builders, Ellin & Kitson, 519 West Twenty-first St.

Greenwich St., No. 364, five-st'y brick tenement and store, tin roof; cost, $15,000; owner, Michael Duff, 127 West One Hundred and Twenty-third St.; architects, Babcock & McAvoy.

Third Ave., w s, 49′ 5″ n Twenty-sixth St., five-st'y brick tenement and store, tin roof; owner, L. Lese, 398 Third Ave.; architect, John G. Prague.

Monroe St., No. 168, five-st'y and basement brick tenement and store, tin roof; cost, $16,000; owner and builder, John Totten, 240 West Forty-ninth St.; architect, M. Louis Ungrich.

One Hundred and Fifty-fifth St., s s, 600′ w Eighth Ave., one-st'y frame, concert platform, tin roof; cost, $5,000; owners, Schlund & Reubert, on premises; architect, J. Kastner.

One Hundred and Thirtieth St., s s, 300′ w Sixth Ave., 4 three-st'y and basement brown-stone front dwells., tin roofs; cost, two each, $15,000 and two each, $12,000; owner and builder, S. J. Wright, 201 West One Hundred and Thirtieth St.; architects, Cleverdon & Putzel.

One Hundred and Twenty-third St., n s, 100′ w Mt. Morris Ave., 4 three-st'y and basement brown-stone front dwells., tin roofs; cost, each, $13,000; owner, Anthony Smyth, 22 West One Hundred and Twenty-sixth St.; architects, Cleverdon & Putzel.

West Thirty-seventh St., Nos. 445, 447 *and* 449, 3 five-st'y brick tenements, tin roofs; cost, $13,000; owner, Adam Grasmuck, 443 West Thirty-seventh St.; architect, John M. Forster.

ALTERATIONS. — *West Thirteenth St., Nos.* 160 *and* 162, two-st'y brick extension, tin roofs; cost, $4,000; owner, John Gault, 71 Broadway; architects, D. & J. Jardine.

Fifth Ave., No. 385, one-st'y and basement brick extension, tin roof; also internal alterations; cost, $12,000; owner, Samuel S. Sands, 80 Fifth Ave.; architects, D. & J. Jardine.

Philadelphia.

BUILDING PERMITS. — *Jasper St.*, n e cor. York St., three-st'y addition to dye-house, 18′ x 49′; Eldredge & Stewart, contractors.

Willow St., Nos. 704 *and* 706, 2 vaults, 16′ x 38′; L. Schaumberg & Co., owners.

Emery St., n of Bockins St., two-st'y dwell., 16′ x 26′; Amos Crosta, owner.

Walnut St., No. 425, three-st'y addition to building, 21′ x 50′; Samuel Hart, contractor.

Passayunk Road, No. 1719, three-st'y dwell., 16′ x 40′; I. Knieling, contractor.

North Eighth St., No. 1600, carpenter-shop, 16′ x 24′; E. Thompson, owner.

Franklin St., above York St., 3 two-st'y buildings, 14′ x 42′; Amos D. Kennedy, owner.

St. Louis.

BUILDING PERMITS. — Forty-eight permits have been issued since our last report ten of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

J. W. Zipf, two-st'y brick dwell.; cost, $4,700; A. Beinke & Co., architects; H. Burns, contractor.

Fred. Nolkaemper, 3 adjacent two-st'y brick tenements; cost, $6,000; Aepken & Tramel, contractors.

Fred. Nolkaemper, 3 adjacent two-st'y brick tenements; cost, $6,000; Aepken & Tramel, contractors.

Fred. Nolkaemper, double brick tenement; cost, $4,000; Aepken & Tramel, contractors.

Abner Cooper, 8 adjacent two-st'y brick tenements; cost, $15,000; contract sublet.

E. Engendorf, 3 adjacent two-st'y brick dwells.; cost, $8,000; Wm. Grahl, contractor.

Fred. Stock, two-st'y store and tenement; cost, $3,000; Chas. May, architect; Aug. Fink, contractor.

Henry Stelmann, two-st'y store and tenement; cost, $3,850; Chas. Gerhardt, contractor.

Wm. W Kaane, two-st'y double tenement; cost, $3,000; Alfred M. Baker, contractor.

Chas. Seibert, two-st'y double tenement; cost, $3,000; Wm. Rieve & Son, contractors.

O. Schmitz, two st'y brick dwell.; cost, $4,800; E. Jungenfeld & Co., architects; A. Haesseler, contractors.

Anthony Kessler, one-st'y brick warehouse; cost, $4,000; A. Haesseler, contractor.

M. G. Hoyt, two-st'y brick dwell.; cost, $7,000; F. S. Green, contractor.

Hoyt Metal Co., one-st'y brick factory; cost, $3,400; F. S. Green, contractor.

Patrick Banbrick, two-st'y brick dwell.; cost, $3,000; T. Murphy, contractor.

S. P. Garrey, two-st'y store and dwell.; cost, $4,300; F. Herrmann, contractor.

Robt. Berry, two-st'y brick dwell.; cost, $3,000; Henry Meyer, contractor.

Philip Van Phul, two-st'y brick dwell.; cost, $4,500; Jno. Costello, contractor.

St. Paul, Minn.

STORE.—Brick and frame building to be built for Mr. T. P. Boyd; cost, $18,000; Hedgson, Wallingford & Stern, architects.

BUILDING PERMITS. — *Wallace St.*, e s, between Arcade and Maple Sts., two-st'y frame stores and dwell.; cost, $2,475; owner, Chris. Ash, 918 Tremont St.

Payne Ave., w s, between Whitall and Ross Sts., two-st'y frame store and dwell.; cost, $1,500; owner, Mr. Frank Anderson.

Bates Ave., w, between Hudson and Plum Sts., two-st'y frame store and dwell.; cost, $2,000; owner, Mr. Peter Hoffman.

Virginia Ave., w s, between Ellen and University Sts., two-st'y frame dwell.; cost, $1,500; owner, Patrick McAvinchy.

Martin St., n s, between Western and Virginia Sts., two-st'y frame dwell.; cost, $2,400; owner, Jacob Richter.

Seventh St., s s, between Robert and Minnesota Sts., three-st'y brick block, stores and offices; cost, $18,000; owner, Wm. B. McKowen, Jackson, La.

Holly Ave., s s, between Kent and Mackubine Sts., two-st'y frame dwell.; cost, $3,500; owner, J. G. Glass; architects, Hodgson, Wallingford & Stern.

East Seventh St., n s, between Mendota and Forest Sts., two st'y frame store and dwell.; cost, $1,225; owner, Christ. Albrecht.

Lawson St., s s, between Bradley and Jessie Sts., frame Norwegian church; cost, $1,850; John Nelson, trustee, 700 Robert St.

General Notes.

ALLENTOWN, PA. — Koch & Shankweiler are about building a block of brick and Sutherland Falls marble, 46′ x 119′, five-st'y; cost, $75,000; to be occupied as store on first floor, and hotel above; L. S. Jacoby, architect.

AUGUSTA, ME. — The bill passed by Congress, February 10, for the erection of a new public building in this city was secured mainly through the enterprise of Hon. J. H. Manley.

BLOOMSBURG, PA. —T. L. Gunton is about building a frame residence, costing $3,500.

BOONVILLE, IND.—The Air-Line Company intends to build a new and handsome passenger-depot at Boonville, Ind., in the near future.

FERGUS, MINN.—If Fergus gets the third insane asylum, as no one here seems to doubt, the building season will open up with considerable activity. The asylum, county jail, new flour mill and Second ward school, to say nothing of several private buildings to be erected, will bring city improvements pretty well up to $1,000,000 for the season of 1885.

The Board of Education met for the purpose of taking action on the new Second ward school building. It is presumed, though the matter is not yet decided, that a four-room building will be erected at a cost of $15,000.

HARTFORD, CONN. — The Council Board last evening ordered the preparation of an ordinance to prevent the erection of buildings without leave. It has been common for intending builders to put in a petition and then go on with the work. If they had the verbal assurance of the committee that the report would be favorable, so much the better, but many buildings have made much progress without even this. There has been complaint of the practice, but nothing has been done to stop it. The ordinance asked from the committee is to forbid carrying on building work until the permit has been given, under a penalty of $25 for each day's disregard of the law.—*Courant.*

INDIANAPOLIS, IND. — Indianapolis wants authority from the State to build a new city-hall.

JACKSON, TENN. — The Tennessee Legislature, on January 29, passed a bill to spend $85,000 in building an insane asylum at Jackson.

KANSAS CITY, MO. — The plans for the new building to be erected on the cor. of Sixth and Main Sts., by Mr. Lobenstein, are in the hands of the architect. It is to be 50′ x 142′, and six-st'y in height. It will be of enriched terra-cotta, pressed and glazed brick, and will cost about $75,000.

Dr. Flanders, 8 two-st'y and basement residences, 601–615 East Sixteenth St.; cost, $12,000.

J. M. Jones, a $4,000 brick house, at 1405 Locust St.

Mrs. Catherine Rogers, two-st'y brick house, at 1306 Baltimore Ave.; to cost $4,000.

PITTSBURGH, PA.—The Union Iron Mills of Carnegie Bros. & Co., employing over four hundred men, resumed operations in all departments, February 16.

PLAINFIELD, N. J.—At Washington Rock, New York capitalists, who have formed a stock company, propose at an early date to begin work on a large hotel. The hotel will be built of brick, four stories high, with a frontage of 400 feet. The company are also to erect some twenty or thirty cottages and a fine drive. The "Rock" is about four miles from Plainfield, at an elevation of 600 feet.

PLEASANTVILLE, N. J. —Over $15,000 have been subscribed toward the erection of a factory here, for the manufacture of type-setting machines. When $75,000 is subscribed, the work of erection will begin.

PORTLAND, ME. — Gen. Brown, for the Executive Committee of the Soldiers' and Sailors' Monument Association, has filed a petition asking that Market Square, now occupied by Market Hall, be given to the association, for the erection of a monument, and asks that a special meeting of the boards may be called to act upon it. The Mayor has decided that the municipal year is so nearly expired that the request must go over to the next City Government. The association's proposition is to erect within three years a monument costing not less than $20,000.

OHIO BUILDING NOTES. — The Ohio Legislature has before it bills as follows: to erect a town-hall for Wellington Township, Lorain Co.; to erect a town-hall in Columbia Township, Hamilton County; to authorize Ashland County to borrow $30,000 for a jail and sheriff's house.

SAN FRANCISCO, CAL. — It is reported that Messrs. Flood and Mackay have decided to erect two business blocks on their lots at both the corners of Market and Fourth Streets, each costing in the neighborhood of $1,500,000. Work will be begun in the spring.—*San Francisco Chronicle.*

SPRINGFIELD, MASS. — Plans were adopted, February 11, for a $20,000 building, in which to house the recently-formed School for Christian Workers, the only thing of the kind in the country.

YANKTON, D. T. — The list of contemplated building improvements in Yankton the coming season foots up $800,000.

COMPETITION.

CITY-HALL.

[At Richmond, Va.]
February 16, 1885.

Proposals are invited **until June 1st, 1885.** for furnishing designs for a city-hall upon which premiums will be paid as follows: —

For first best design, $700.

For second best design, $300.

The Committee on Grounds and Buildings of the City Council reserves the right to reject any and all designs.

For information address the undersigned.

487 W. E. CUTSHAW, City Engineer.

PROPOSALS.

BREAKWATER.

[At Black Rock Harbor, Conn.]
ENGINEER OFFICE, U. S. ARMY,
11 INSURANCE BUILDING,
NEW HAVEN, CONN., February 4, 1885.

Sealed proposals for constructing a breakwater at Black Rock Harbor, Conn., will be received at this office **until 10 o'clock. A. M., on Tuesday, March 10, 1885.**

Proposals must be made in triplicate. Specifications, blank forms and instructions to bidders may be had on application at this office.

WALTER MCFARLAND,
480 Lt.-Col. of Engineers.

WOOD FRAMING, GALVANIZED IRON-WORK, ROOF COVERING, ETC.

[At Frankfort, Ky.]
OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., February 13, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 6th day of March, 1885,** for furnishing and fixing in place complete, the wood roof framing, galvanized iron-work, roof covering, etc., for the court-house, post-office, etc., building at Frankfort, Ky., in accordance with drawings and specifications, copies of which and any additional information may be obtained on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, for $300, and those received after the time of opening will not be considered. M. E. BELL,
479 Supervising Architect.

BRICK, CEMENT, ETC.

[At Philadelphia, Pa.]
PUBLIC BUILDING, PENN SQUARE.

Sealed proposals will be received at the Office of the Commissioners, in the building, **until 12 o'clock, noon, of Tuesday, March 3, 1885,** for all the bricks, cement and coal required during the present year.

Blank forms, with envelopes can be had on application at the office of the architect in the building, second floor, south front.

The Commissioners reserve the right to reject any or all bids.

By order of the Commissioners.

SAMUEL C. PERKINS, President.
Attest: WM. B. LAND, Secretary. 479

PROPOSALS.

NOTICE TO BIDDERS.

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., February 16, 1885.

The limit of cost of the court-house, etc., at Erie, Pa., having been extended, proposals as advertised, will not be opened at this office on the 28th instant.

New plans will be prepared embracing the extension, and the work will be re-advertised as soon as they are ready. M. E. BELL,
478 Supervising Architect.

RAILWAY-STATION.

[At Reading, Pa.]
PENNSYLVANIA RAILROAD COMPANY,
OFFICE OF CHIEF ENGINEER,
PHILADELPHIA, PA., February 10, 1885.

Sealed proposals will be received at this office **until 9 A. M., February 23,** for furnishing all labor and materials, and erecting complete (excepting foundations) a brick passenger-station at Reading, Pa., on the line of the Pennsylvania Schuylkill Valley Railroad. Plans and specifications can be seen at Room 16, third floor, "Annex" Building, 233 South Fourth Street, Philadelphia, also at Assistant Engineer's Office, No. 520 Washington St., Reading, Pa.

WM. H. BROWN,
478 Chief Engineer.

PAINTING, POLISHING AND GLAZING.

[At Kansas City, Mo.]
OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., February 10, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 10th day of March, 1885,** for all the painting, polishing and glazing required for the custom-house, etc., building at Kansas City, Mo., in accordance with specification, copies of which and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
478 Supervising Architect.

JAIL.

[At Scranton, Pa.]
OFFICE OF THE COMMISSIONERS OF LACKAWANNA COUNTY,
SCRANTON, PA., January 24, 1885.

Sealed proposals for the erection and completion of a county jail for Lackawanna County, to be located on the corner of Washington Ave. and New York St., in the city of Scranton, Pa., will be received by the undersigned Commissioners of said county, at their office **until Thursday, February 26, 1885, at 10 o'clock in the forenoon.** Plans and specifications will be on file at the court-house in the city of Scranton, on and after Tuesday, January 27, 1885. The builder to whom the contract shall be awarded will be required to enter into bonds with at least two approved sureties for the sum of $20,000, for the faithful performance of the contract. Work to be commenced within thirty days after the awarding of the contract, and to be finished on or before April 1, 1887.

The Commissioners reserve the right to reject any or all bids.
WM. FRANZ,
H. L. HALSTEAD,
WM. J. BURKE,
County Commissioners.
Attest: D. W. POWELL, Clerk. 478

STONE AND BRICK WORK, ETC.

[At Erie, Pa.]
OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 27, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 28th day of February, 1885,** for furnishing and setting all the stone and brick work for the superstructure of the court-house, post-office, etc., at Erie, Pa., in accordance with specifications and drawings, copies of which may be seen and any additional information obtained at this office or the office of the local superintendent of the building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
478 Supervising Architect.

COURT-HOUSE ALTERATIONS.

[At Preston, Minn.]
PRESTON, January 9, 1885.

The County Commissioners of the County of Fillmore, in the State of Minnesota, will receive sealed proposals **until the 25th day of March, 1885, at 12 o'clock, M.,** at the office of the county auditor, in the village of Preston, said county, for the remodeling of the county court-house in said village, and the building of 2 two-st'y brick additions thereto, and iron vaults therein, and the furnishing all materials, in accordance with the plans and specifications therefor on file in the office of said auditor, which can also be seen at the office of Mayberry & Son, architects, Winona, Minnesota.

No bids will be received except for the whole building complete as specified.

The successful bidder will be required to give a sufficient bond with sureties, within a reasonable time to be fixed by said commissioners, in the sum of $15,000, to be approved by said commissioners, conditioned upon the faithful performance of his contract.

Each bid must be accompanied by a sufficient bond with sureties, or a duly certified check payable to said county in a sum of at least five per cent of such bid, conditioned upon the giving the bond above specified within the time so fixed, provided such bid should be accepted. The work will cost several thousand dollars, and must be completed on or before the first day of November, 1885. Right reserved to reject any or all bids. J. G. MINER,
Chairman Board of County Commissioners.
Attest: G. A. HAYES, County Auditor.
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The American Architect and Building News.

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FEBRUARY 28, 1885.

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CONTENTS.

THE office of Inspector of Buildings for the city of New York, left vacant by the resignation of Mr. Esterbrook, has been filled by the appointment of a thoroughly-trained professional architect, Mr. Albert F. D'Oench. Mr. D'Oench, who is personally known to many architects in and about New York, and by name to many more in all parts of the country, is a young man, having been born in St. Louis in 1853. He received the best technical education that his native city could afford, and then crossed the water and entered the Royal Polytechnic School at Stuttgart as a student of engineering and architecture. After completing his course he came to New York, and entered the office of Mr. Leopold Eidlitz, who employed him to supervise the work upon the Capitol at Albany, and gave him also partial charge of other important buildings. On leaving Mr. Eidlitz's office, he entered that of Mr. Richard M. Hunt, and later, that of Mr. Edward E. Raht, for whom he acted as chief assistant until he undertook business for himself, two years ago. It is hardly necessary to remind architects that Messrs. Eidlitz, Hunt and Raht stand at the very head of the profession, as skilful and conscientious masters of the art of construction, and Mr. D'Oench could not have been trained in a better school to fit him for the important duties which will now devolve upon him. We are glad to be able to congratulate the architects and builders of New York that the choice of the Fire Commissioners should have fallen upon so excellent a candidate, and we trust that he will, in the administratiou of his office, be cordially and effectively supported by all the members of his own profession.

THE commencement of the new Inspector's career augurs well for the future. Hardly had he taken possession of his office, when, as we learn from the New York *Commercial Advertiser*, orders were issued for the immediate construction of brick proscenium-walls in three important theatres, Niblo's Garden, Daly's Theatre, and the Thalia Theatre; and for the erection of fire-escapes on the three street fronts of the Grand Union Hotel in Park Avenue, as well as on the Coleman House, Gilsey House, and St. James Hotel on Broadway, the Windsor Hotel on Fifth Avenue, the Union Square Hotel, and Earle's Hotel on Canal Street. Besides the hotels, various school buildings, including the College of St. Francis Xavier, and one or two public schools, were ordered to be furnished at once with fire-escapes or additional stairways. It is doubtful whether even Mr. Esterbrook ever issued mandates relating to so many important buildings in one day, and Mr. D'Oench will probably find his resolution severely tried before they are all enforced; but if he is determined enough to carry them out, his control over the matters which the law puts in his charge will be for the future undisputed.

WE are indebted to the kindness of Mr. J. M. Bancroft of New York for some interesting information as to the best modes of preventing conflagrations, the sending of which to us was suggested by a recent paragraph in which we mentioned the frightful losses which are annually inflicted upon this country by forest fires. We have before called attention to the fact, insisted upon by all fire engineers and intelligent insurance officials, that a small quantity of water applied during the first moments of a fire is more effective than thousands of gallons poured on when the flames have gained headway. To use the expression of Mr. Woodbury, "the most essential fire apparatus consists of pails of water," or, as he says further, "Twice as many fires are put out by pails as by any other means;" and any one can recall instances where even a quart or two of water, applied at the right moment to a blazing ash-barrel, or a smoking roof or floor, has saved much property, and even life. These facts being familiar to everybody, it is strange that more has not been done to systematize the use of small and simple appliances for putting water on fires, and to provide for having them always available, instead of leaving the good work which they are capable of doing to be performed by chance, or rather, by the improbable meeting at or near the place in danger of a pail filled with water and a man or woman cool enough to apply it effectively to the fire.

AS an indication of the mode in which the service of these homely but powerful methods of saving life and property may be organized into a most useful system, Mr. Bancroft quotes the example of the town of Wakefield, Massachusetts. This town, about which we happen to know a good deal ourselves, covers a large area, and is, moreover, divided nearly through the middle by two large ponds, the length of the two together being nearly two miles. There are several large manufactories in the place, and these, with the population dependent on them, and the school-houses, stores and churches, with the fire-engine-houses, are concentrated in a rather closely-built village near the principal railroad station. To get with a fire-engine from the central village to the outlying parts of the town, particularly to those on the farther side of the ponds, requires a good deal of time, and, as those who live in the rural portions of country towns well know, a fire in these portions generally results in the total destruction of the building attacked. Under these circumstances, as Mr. Bancroft tells us, Mr. Rufus Kendrick, the energetic owner of an estate at the upper end of the town, was inspired with the idea which, with the coöperation of his friends and neighbors, was afterwards carried into effect, of organizing a Home Fire-Protective Association, for the sole purpose of encouraging and enabling the inhabitants of the more distant sections of the town to keep small hand appliances ready for use, and to employ them to the best possible purpose. The apparatus with which the members of this Association are armed consists simply of what is commonly known, although now made by various parties, as the Johnson pump, a double-acting syringe, which is placed in a pail of water and held down by the foot, leaving the hands free to operate the piston and direct the water thrown from the short hose connected with the syringe. The whole affair costs only six dollars and a half at retail, but has the advantage over a simple pail that the stream can be thrown forty or fifty feet horizontally, or twenty-five feet vertically. After furnishing itself with these weapons, the Protective Association adopted a rule by which, to encourage the members in their work, a prize of one dollar is given to the holders of each of the three pumps which first arrive, in condition for service, at the fire. The same reward is offered, for the sake of impartiality, to the regular engine companies, but as the Association pumps are always ready, and need only one person to carry them to the fire, they are almost always there first. At present the Association has fifty pumps scattered through the town, and, with the help of its simple system of rewards, has proved itself the most effective means of preventing fires ever known.

DURING the year 1883, the first year of the existence of the Association, there were nineteen fires in the town, thirteen of which were put out entirely, or so far subdued that regular engines were not used at all, by the members of the Association with their little pails and squirts. Of the remaining six three were put out by the regular engines, and three others had acquired too much headway to be controlled by any means, and resulted in the total destruction of the

buildings in which they occurred. The cost for the year of the pumps, which had put out more than four times as many fires as the large engines, was one-half of one per cent of the expense of the whole fire department during the same period; or to put it as the *Insurance Monitor* does, ten dollars spent on the hand-pumps gave the same result as eight thousand six hundred and sixty-six dollars spent on the engines. This is a sufficiently striking indication of the value of the small-appliance system; but the record of the Association for the next year is far more satisfactory still. The members had probably gained skill by the experience of the previous year, and their number had perhaps increased, for we find that in 1884, although there were twenty-six fires, the hand-pumps arrived first at every one, and put out all but three of them. Thirteen of the fires were in the fields or woods, where the application of a few gallons of water in a stream one-eighth of an inch in diameter might, it would seem, to be of comparatively little use; but so great is the efficiency of a little water, early applied, that all these were controlled. We may say for ourselves that although we knew of the success of this Association, and felt the additional value which its existence conferred on property in Wakefield, it had never occurred to us that so admirable a system was confined to that town. We hope this will not long be the case, and will certainly try to do our part, by calling attention to such of the future exploits of the Association as may come within our knowledge, to encourage any of our readers who may be influential in other communities to emulate its example.

LE GENIE CIVIL contains an interesting article on technical schools for instruction in the various textile industries. The article begins by tracing the movements of trade in woven fabrics, and explaining them, in some cases in a striking manner, by showing the influence of such schools in developing the industries with which they deal. Few persons, probably, not engaged in the trade, comprehend the changes which have taken place within a few years in the manufacture of fine fabrics. Those who studied the exhibits at Philadelphia nine years ago will remember the surprise with which they saw a few silks and velvets, which they had supposed to be a monopoly of the French weavers, marked with German names; but so rapid has been the development of German skill that at this moment the cashmeres, silks, satins, velvets and trimmings of Berlin, Annaberg, Barmen, Crefeld, Mülheim, Elberfeld and Aix-la-Chapelle, although sold to a great extent under French names, practically control the markets of the world. Lyons, with the aid of a new regulation, which permits cotton yarns used in the manufacture of velvets and other fine goods for exportation to be imported free of duty, has recently improved its condition, and sends goods to Germany, but of cheaper materials, such as cotton-velvets, cashmeres and heavy cloths. France itself buys immense quantities from Germany. As an illustration of the way in which this change has been brought about, the example of Crefeld is cited. A few years ago, Crefeld, formerly a flourishing manufacturing town, was on the verge of ruin. Its ancient silk-weaving establishments, surpassed in every respect by those of France, Switzerland and England, could no longer compete with them, and their export trade had disappeared. At this juncture a few thoughtful manufacturers of the town, convinced that something must be done at once, established in their midst a school of weaving. This school has prospered, and its increasing prosperity has been attended with a corresponding revival of the industries of Crefeld, until now the Crefeld goods have to a considerable extent superseded those of Lyons even in France, and are driving the Lyons fabrics out of the New York market. Schools more or less similar to that of Crefeld now exist at Berlin, Munich, Dresden, Stuttgart, Carlsruhe, Aix-la-Chapelle, and many other places in Germany, at Zurich and Winterthur in Switzerland, and in one or two towns in Italy; and the art of spinning, weaving and coloring fabrics, and of selling them to the best advantage, is taught to three or four thousand attentive pupils every year. The course of instruction generally extends over three years, and comprehends all the principal European languages, elementary mathematics and mechanics, commercial geography, and elementary chemistry, with a little political economy and commercial and international law. After the first year, the pupil begins his special studies, giving half his time to actual practice in designing, spinning, weaving and dyeing, and in treating raw materials. The physical character of various fibres is also investigated, analyses are made of samples of cloth, and instruction is given in dressing, finishing and packing goods, in setting up, repairing, and caring for machinery, and in many other details of industrial life. The pupil in these schools has no time for idleness. He is required to spend from nine to ten hours a day in study and practice; and it is not surprising that after three years' tuition a good student acquires knowledge and resources which enable him on graduation to supervise and direct textile manufactures with an effectiveness and economy which are worth many times his salary to his employers.

ACCORDING to the *Scientific American*, a device has been patented by the well known Captain Petersen for increasing the strength and facilitating the management of balloons, by connecting them in long trains. Except the end sections, each member of Captain Petersen's train has a cylindrical gas-holder, with a car so shaped that it can be readily and closely connected with those behind and in front of it, and each car has its separate motor and steering apparatus. Although the weight of material to be lifted by a given bulk of gas would probably be greater with such a construction than with balloons of the ordinary shape, the sectional arrangement offers many advantages. If a section, for instance, is damaged, it can be quickly disconnected, and the remaining portions coupled together, or a new section taken up at one of the stations which it is proposed to establish on the regular balloon routes. So confident is the inventor of the practical value of this device that a company has already been incorporated for carrying it into actual use; and although we are not convinced that such trains will prove to be the most economical or efficient appliances for aërial navigation, we have no doubt that sailing through the air will before long be a common mode of locomotion, and we shall be glad to see any experiments made which may render it, when it comes, safer and more economical.

THE *Metal Worker* mentions some new applications of luminous paint, which are of considerable interest. Considering the cheapness of the materials for making this substance, it is surprising that it has not come more into use. We are not sure whether any patent exists on the paint known as Balmain's, but even if there is one, very effective substitutes can be made from the same materials, sulphur and lime, by processes which were public property forty years ago, and the cost of these compounds would represent but a small fraction of the price demanded for the luminous paint of modern times. Most of our readers probably know something of the application of the paint to match-boxes, key-holes, clock-dials, door-knobs and name-plates, and have perhaps heard, with some incredulity, about the English-railway car painted on the inside with it, which is said to have been so brightly illuminated that the passengers could see to read without other light; but within a short time the application of the paint has been extended to certain portions of harness, fishing-tackle, fire-buckets, lanterns, compasses, and engineers' tapes. The latter, in particular, are said to have been adopted in the British Army for use in laying out fortifications. If a party is detailed to throw up earthworks by night, the engineer officers go first to the spot, and with the luminous tapes measure off the ground, and lay down a shining line around the exact plan of the intended fortification. The working party follows, and finding the ground thus visibly marked out for them, the men simply dig their ditch, and throw up the earth into a breastwork, on the lines formed by the tapes. No lanterns or other lights of any kind are needed, and the entrenchments can be planned and executed without indicating the movements of the party to the enemy. We have an idea that the manufacturers of the paint could, if they wished, greatly extend their market by making the uses and price of their product better known among architects. It is said that they export large quantities for painting doors and door-handles in countries troubled with frequent earthquakes, to satisfy the demand in such places for some means of indicating quickly the way of escape from the bedrooms to the street, in case a shock should be felt at night; and judging from analogy, we should say that the fear of falling down the cellar stairs, which is much more widely diffused among civilized nations than that of being crushed by an earthquake, might, if the mode of alleviating it by painting the walls of the stairway with luminous paint were once pointed out, prove the source of a demand at once extensive and permanent.

STATUES AND MONUMENTS OF LONDON.[1] — IV.



Monument to Lord Chatham, Westminster Abbey. Bacon, Sculptor.

THE next group of monuments dates from the first known of British sculptors, Nicholas Stone. Sir Francis Vere and Sir George Holles were kinsmen and comrades in arms, and they died nearly at the same time. The tomb of Vere, 1606, is of pure Gothic style, the figure recumbent. That of his friend, within a few feet, is in a totally new style; the statue is erect, it is depicted in the costume of a Roman general, it surmounts a monument with allegorical figures. It is a singularly pleasing monument, but unfortunately badly placed in the Abbey, and nearly hidden by the Vere monument. It is the first statue in the Abbey which stands erect, and therefore marks a new era. It was erected by Nicholas Stone in 1626 for Lord Clare, who paid £100 for it. For another of the Holles family, Francis, son of the Earl of Clare, 1626, a figure also erect, which Horace Walpole describes as "of most antique simplicity and beauty." Stone received £50 only; twenty years earlier Stone had erected the beautiful monument with recumbent statues of Sir George Villiers and his wife, 1605, for which he received £560, and five years after the Holles statue he erected the splendid Renaissance monument of Dudley Carleton, 1631, in the earlier style, for which he received £200. These and the tablet to Casaubon, 1614, are the representatives of Stone's work in the Abbey, and excellent all of them are in their different styles, and well worthy of study, as indicating the change that was coming about. There are no more purely classical statues in the Abbey than those of the two Holles. Elsewhere we have of Nicholas Stone, the statue of Sir Julius Cæsar in St. Helen's, Bishopsgate, and the curious figure of Dr. Donne in his winding sheet in St. Paul's, which survived the destruction of the older church.

Nicholas Stone, born 1586, died 1647, was the father of modern English sculpture; after him came Cibber, 1630 to 1700; Bird, 1667 to 1731; Grinling Gibbons, 1683 to 1721; Roubiliac, 1698 to 1762; Rysbrack, 1693 to 1770; Scheemaker, 1680 to 1769; Joseph Wilton, 1722 to 1803; Nollekens, 1737 to 1823; Banks, 1733 to 1805; J. Bacon, 1740 to 1799; Flaxman, 1755 to 1826; Chantrey, 1782 to 1842; Westmacott, 1775 to 1855; Gibson, 1790 to 1866; and Foley, 1818 to 1879; all of whom are represented by their works in the Abbey, many of them by numerous works. The one exception to this is Cibber, of whom there is nothing in the Abbey, and of whose work in sculpture the only examples we have in London are the statues of Melancholy and Madness in the entrance hall of Bethlem Hospital, so famous for their realism — statues referred to in the well-known lines of Pope when speaking of Cibber's son —

> Where o'er the gates by his famed father's hand
> Great Cibber's brazen brainless brothers stand.

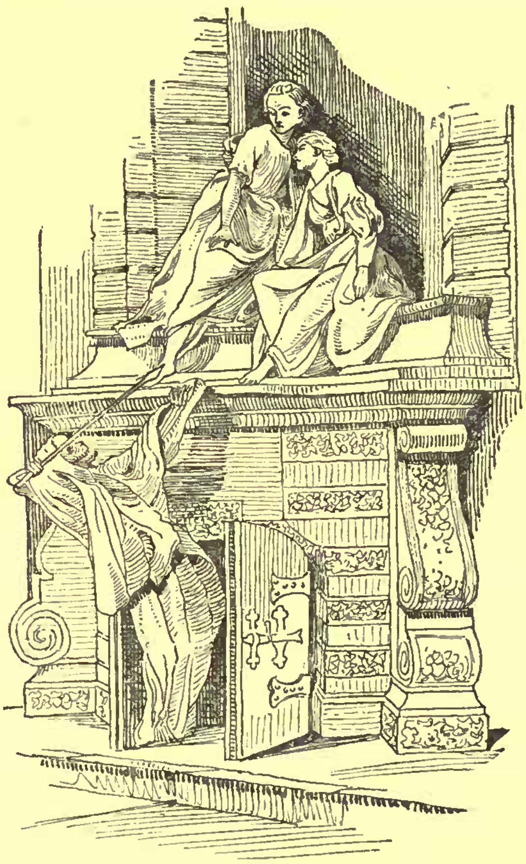
From the above list of sculptors it is evident at a glance how much we owed to foreign art, and especially to the school of sculpture in Flanders.

The next in the list to Cibber is Bird, to whom the Abbey owes the great architectural monument in the composition of which he was assisted by the architect Kent, and where the half-recumbent statue of Holles, Duke of Newcastle, is rising from a kind of altar-tomb, while Justice and Prudence are standing by. It is the first of a series of works in which allegorical figures occupy the most prominent position. Indeed, the era from 1650 to 1820 represents in monumental sculpture one in which classical and allegorical figures abound and often overshadow or supplant the subject of the monument. It would be amusing to count the number of Britannias, Neptunes, Victorias, Fames, figures of Justice, Mercy, Eloquence, etc., which are to be found in the Abbey and St. Paul's on monuments during this period. The craze for allegory was carried much farther by Bird's successors. It reached its climax in the great monument by Nollekens to the three captains who were killed in Rodney's victory, Bayne, Blair and Manners, 1782, where a gigantic figure of Neptune is pointing out to Britannia three small medallions, on which the heads of the captains are given in low relief, while Victory from above is holding over them a crown. The subjects of the monument have here disappeared almost wholly, and the immense space is devoted to allegorical figures without interest and with little of beauty. Many other examples of this kind are to be found in the Abbey.

To return to Bird, we have from him the semi-recumbent figure of Dr. Busby, and the semi-recumbent figure of Sir Cloudesley Shovel, 1717, depicted in Roman costume and a wig, a singular mixture, lying in the midst of an architectural structure, and as remote from one's conception of the gallant old admiral as could possibly be.

Of Grinling Gibbons we have but one monument in the Abbey — Mrs. Beaufoy, a charming half-figure supported by two allegorical figures; beyond this we have nothing in London of Gibbons's sculpture, except the two statues already alluded to. The exquisite wood-carving in the choir of St. Paul's was, however, from his chisel.

Of Roubiliac the Abbey has seven monuments, some of world-wide renown. That which appears to me the most pleasing is the monument to Sir Peter Warren, where Hercules has just placed the bust of the admiral on its pedestal, while Navigation, an allegorical personage, is ready to crown it with laurel. The bust of the admiral is excellent, and the female representing Navigation is a charming figure; the monument reminds one of the work of Bernini. The well-known monument to the Duke of Argyll and Greenwich [see Illustrations], where Fame is engaged in inscribing the name of the hero, and Eloquence is addressing the audience, scarcely needs description; it is a marvellous production of art, however little appropriate to a church. The figure of Eloquence has excited the greatest admiration of artists. Canova said of it that it was the noblest statue he had seen in England. The Nightingale monument is equally well known,



The Nightingale Monument, 1758, Westminster Abbey. Roubiliac, Sculptor.

and its terrible realism and splendid execution have made it famous. His statue of Handel in Poet's Corner is not worthy of either sculptor or subject.

Unquestionably the best work we have of Roubiliac is the statue of Sir Isaac Newton in Trinity College, Cambridge. His statue of Shakespeare in the British Museum is also a fine work, but of greatly inferior interest to that of Newton, as a statue of one who has been dead a hundred years must always draw upon the imagination, while in the statue of Newton we feel that we have before us the man himself. At the mature age of fifty Roubiliac visited Rome, and on his return is reported to have said on seeing again his own work in the Abbey, "By God, my own work looks to me as meagre and starved as if made of nothing but tobacco pipes."

Of his successor in popular favor, Rysbrack, the Abbey has at least twelve works, possibly more. Of these, the two principal are those in the places of honor on either side of the entrance to the choir, Sir Isaac Newton [see Illustrations] and Earl Stanhope, two fine compositions where the principal figures are not lost in their allegorical surroundings. There is also the monument to Milton, a charming bust, deficient only in interest from having been modelled seventy years after the death of the poet, a very tardy recognition of so great a man; the monument to Matthew Prior (1721), of which the beautiful bust by Coysevox was given by Louis the Fourteenth; and the monument to Admiral Vernon (1751), of the typical kind, a bust surrounded by allegorical figures.

His contemporary and successor, Scheemaker, is represented in the Abbey by an equal number of works. Most of them are of the allegorical type already alluded to. His Admiral Wager (1743) is the exact pendant to that of Admiral Vernon by Rysbrack, two allegorical figures bending over a bust. The two are placed on either side of the entrance to the north transept. The monuments to Lord Aubrey Beauclerk (1740), who was killed at Carthagena, under Vernon; Admiral Watson (1757); and Mr. H. Chamberlin (1728), the eminent accoucheur of his day, are of the same type — in all the busts are excellent. In the monument to Sir John Balchen (1744), the bust is wanting; the allegorical figures alone are there, and there is a bas-relief depicting an incident in the life of the hero.

The monument to Monk, Duke of Albemarle, 1720, erected fifty

[1] A paper by Mr. G. Shaw Lefevre, reprinted, with added illustrations, from the *Nineteenth Century*. Continued from page 89, No. 478.

years after his death, under the will of his son Christopher, is a more ambitious performance, and of its kind is a striking work. The figure of Monk himself is fine. That of Sheffield, Duke of Buckingham, and his wife, 1721, is of the older type of recumbent figures on an altar-tomb with a sumptuous canopy. The Duke is in Roman armor, his wife in the ladies' dress of the period. The statue of Shakespeare as an imaginative work executed a hundred years after the death of the poet [see Illustrations], and not equal to those of Roubiliac already referred to. The bust of Dryden, died 1700, on a monument long delayed, and erected by Sheffield, Duke of Buckingham, is one of the greatest gems of Poets' Corner. Generally the busts of this sculptor are of the first quality, and there are very few of the numerous busts which have been placed in the Abbey during the last twenty years which could compare favorably with those of Scheemaker.

In Joseph Wilton we find a sculptor of the same school. His principal work is the immense monumental piece in honor of General Wolfe, 1759, in which the wounded General is depicted lying without clothes (in order that the artist, it is said, might show his anatomical knowledge) in the arms of a fully-equipped sergeant, and receiving a wreath from Victory [see Illustrations]. The bronze bas-relief beneath the figures is by Capitsoldi, and is an excellent representation of the landing of the British troops, and the ascent of the Heights of Abraham. The monument is interesting as showing the struggle between the classical and allegorical school, and the more natural school that was soon to supersede it. Nothing can be more real than the figure of the sergeant; on the other hand the figure of Wolfe in seminudity, though real in one sense, is untrue, and the Victory is a survival from the allegorical school. The monument may be compared with West's well-known picture of the same event, in which the figures are given in their soldier's uniform, and where the artist was almost universally blamed at the time for not representing them in Roman costume. In the monument to Admiral Holmes, 1761, the hero is represented as a Roman general with the usual allegorical attendants.

Of Nollekens, considering his great vogue and his long life, during which he amassed a large fortune by his chisel, and executed an enormous multitude of statues and busts, there are comparatively few works in the Abbey. The immense monumental piece to the three captains killed in Rodney's action, already alluded to, where the allegorical devices have reached their climax, and have extinguished the subject matter of the monument, and the medallion of Oliver Goldsmith, 1744, are among these few. He is handed down to memory by Dr. Johnson, who, upon hearing a discussion as to the merits of various sculptors, said, "Well, I think, sir, my friend Nollekens can chop out a head with any one of them." Mr. Pitt declined to sit for his bust to him, but after the death of the statesman the sculptor avenged himself by getting a cast of his face, out of which he realized £15,000. He obtained an order from Trinity College, Cambridge, for a statue at the price of £4,000; he sold seventy-four busts, for which he received a hundred and twenty guineas each, and which were executed for him by some inferior artist for twenty-four guineas each, and he also sold six hundred casts at six pounds apiece.[1]

Probably the worst of all the sculptors of this school and era whose works have found a place in the Abbey was Read, a pupil of Roubiliac, the author of the atrocious monument to Admiral Tyrell, 1766, a prodigious mass of rocks, clouds, sea and ships, where the admiral, who died peacefully on shore, but was buried at sea, is represented as rising to heaven out of the sea. Roubiliac is reported to have said of this monument, "That figure of Read's of Admiral Tyrell going to heaven out of the sea, looks for all the world as if he were hanging from a gallows with a rope round his neck." This monument confirmed the prophecy which the same great artist is said to have made of his pupil when the latter boasted that some day, when out of his articles, the world would see what he could do, "Ven you do de monument," said Roubiliac, "den de varld vill see vot von d—d ting you vill make."[2]

Another contemporary of Nollekens, and of whose works there are many examples in the Abbey and St. Paul's, was John Bacon (1740–1799). No sculptor has ever had a greater number of subjects of the first importance committed to him. The monument to Chatham in the Abbey, that to the same statesman in the Guildhall, Howard the philanthropist, Warren Hastings, Dr. Johnson, what subjects for a sculptor!

The monument to Chatham in the Abbey is excellent work of its kind. The figure of Chatham itself is good, but it is placed too high, and in subordination too much to the gigantic allegorical figures below, which would appear to be the main object of the composition. There is the same fault in the great monument in the Guildhall. The author appears to have outwitted his rivals in obtaining an order for the Chatham monument in the Abbey, for, while the members of the Royal Academy were considering the terms of a competition, he went direct to the King, who said to him "Bacon, Bacon, you shall make Chatham's monument and no one else." The monument was much approved at the time, and is referred to by Cowper in the lines:—

> Bacon there
> Gives more than female beauty to a stone,
> And Chatham's eloquence to marble lips,
> Nor does the chisel occupy alone
> The powers of eloquence, but the styles as much.

There is a story that when Bacon was re-touching the statue in the Abbey, a clerical gentleman, who was a stranger to him, tapped him on the shoulder and said, in allusion to the story of Zeuxis, "Take care what you are doing, you work for eternity." The reverend gentleman then mounted the pulpit, and began to preach. When the sermon was over, Bacon touched his arm and said, "Take care what you do, you work for eternity."[3]

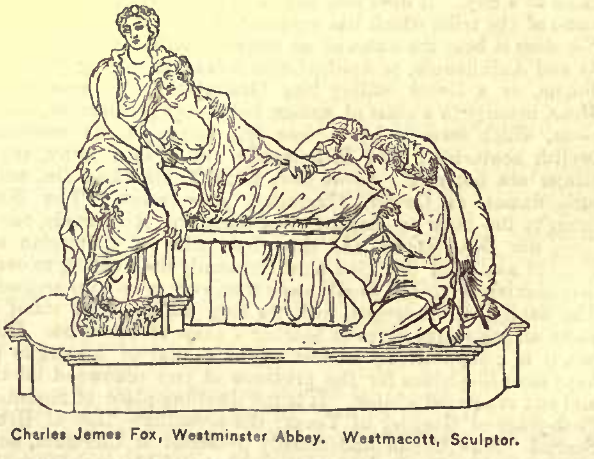
Most people in the present day will prefer Bacon's statues of single figures standing alone without the allegorical accompaniments considered so necessary in those days, such as Howard the philanthropist and Dr. Johnson, both at St. Paul, and very fine examples of his work.

It should here be stated that about this time St. Paul's began to vie with the Abbey for the bodies of the great and their monuments. The first admitted to St. Paul's was Howard, next Sir Joshua Reynolds, and thirdly, Sir William Jones. Dr. Johnson was buried at the Abbey, but his monument was erected in St. Paul's [see Illustrations].

Another contemporary both of Nollekens and Bacon was Banks, of whom men of his own generation formed the highest opinion. Flaxman said of him that "his works had eclipsed the most if not all of his Continental contemporaries." Of his work, we have in the Abbey the monument of Sir Eyre Coote, one of the least attractive of the allegorical monuments in the building, and at St. Paul's there are the monuments of Captain Burgess, killed in the naval battle of Camperdown, and of Captain Westcott, killed at Aboukir; both have the same idea and the same faults. In the former Victory is presenting a sword to the hero, who is represented without clothes. In the latter Victory is supporting the dying hero, who is dressed in a Roman toga. They are unpleasing works, and alone would in no way account for the reputation of this artist among his contemporaries.


Lord Mansfield, Westminster Abbey. Flaxman, Sculptor.

Following the three last-named sculptors at a distance of twenty years, but surviving Nollekens only by three years, was Flaxman (1755–1826), one of the most gifted artists this country has produced; a man possessed of high imaginative qualities and the purest taste, regulated and cultivated by a long study of Greek art. There are several of his works in the Abbey and St. Paul's: the best is the monument to Lord Mansfield, which he produced immediately on his return from Rome, where he had spent seven years. It raised him at once to the highest position among sculptors. Banks said of it, "This little man will cut us all out." The figure of Lord Mansfield is a noble one, simple in its attitude and severe in its look. The two allegorical figures, Wisdom and Justice, do not eclipse the main figure, and are properly subordinated to it. There is also a monument of his in the Abbey to Captain Montague, and an interesting bust of Paoli. His works in St. Paul's are of inferior order. He seems to have been carried away by the fashion for allegory. In the monument to Nelson [see Illustrations], Britannia directs the attention of two young seamen to the figure of the Admiral; in that to Lord Howe, History writes in letters of gold the names of the battles in which he


Charles James Fox, Westminster Abbey. Westmacott, Sculptor.

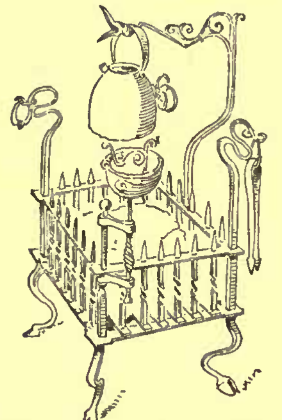
had fought, while Britannia and her lions are at his feet. The figure of Nelson is powerful. The statue of Sir Joshua Reynolds is also excellent, and shows the sculptor at his best.

Sir R. Westmacott was the sculptor most in favor after those just

[1] "*Life of Nollekens*," Vol. ii, p. 43.
[2] "*Ibid*," Vol. ii, p. 95.
[3] Allan Cunningham's "*Lives of British Sculptors*," p. 243.

named; born in 1775, he lived till 1855, and contributed a number of works to the Abbey and St. Paul's. In the Abbey are his monuments of Pitt and Fox, near to one another, as are their graves in another part of the Abbey; of Addison, Spencer Perceval and Tierney; and of the Duc de Montpensier; while in St. Paul's are those of Lord Collingwood, Lord Duncan, Sir R. Abercrombie, and others. His three statues of Canning, Duke of Bedford and C. J. Fox have already been alluded to. It cannot be said that in any of these he reached a high level. His monumental works have all the defects of the dying school of abstract personification and allegorical groups, while his single statues are ponderous and without expression. The monument of Fox in the Abbey is specially ill-conceived. Fox is represented half-recumbent and half-naked. The monument to Spencer Perceval is one of the most awkward and unpleasing in the Abbey. With Westmacott we reach the close of the allegorical group: whether the public was surfeited of them or whether the artists felt unable to invent any fresh combination of them, or whether the growth of better taste rejected such designs, we find that they came to a timely end.

TO AUVERGNE — CLERMONT.[1]



WROUGHT IRON PORTABLE GRATE.
From Moniteur des Architectes.

We are at last in Auvergne and in its capital, in the city which looks up at the hills which once were as Etna has been from the beginning of recorded history, as Vesuvius has been from the days of Titus. And one thought cannot help suggesting itself. When Spartacus and his band found shelter in the crater of Vesuvius, no man looked for an outburst of flame from Vesuvius any more than we now look for an outburst of flame from the Puy de Dôme. Yet Vesuvius was but a quenched furnace, a furnace which was to be kindled again. Can we conceive that some day Clermont may be as Catania or even as Pompeii? Anyhow we look on that wonderful land where every height, from the mighty Dôme almost to the smallest hillock, bears signs of once having sent forth its pillars of cloud and pillars of flame. Straight in front, as we look westward, rises the Dôme itself, where Mercury may well have been fancied as lighting on the heaven-kissing hill that was crowned with his own temple. To the south, like a greater Tor of Glastonbury, rises Mont Rognon, crowned with the shattered castle of the Arvernian Dolphins, and beside it, like Uleybury on the edge of Cotswold, the long natural castle of Gergovia, where baffled Julius left his sword in the hands of the Arvernian warriors of an elder day. To the north stretches far away the great plain of Limagne, like a vaster Sedgmoor at the foot of loftier Mendips and Quantocks. On the whole, there is much in the scenery of Auvergne to suggest the scenery of Somerset and Gloucestershire; the ranges, the bluffs, the hills, great and small. Sometimes, when we come on heaps of primeval cinders, our thoughts might rather leap to the other side of Severn and the Severn sea. There are parts of Auvergne and Velay where we seem to be threading our way through a Dowlaif ready made by the hand of Nature.

But our present business is with the city which is the head of the Arvernian land. We at once mark its present name as belonging to quite another class from either of the accustomed types of Gaulish names. It does not, like Tolosa and Rothomagus, keep its original name as a city. It does not, like Andegavi and Lemovicæ, keep the name of the tribe which has supplanted the name of its own town. Nor does it bear the name of an emperor, either alone like Constantia and Aurelianum, or finished with a Gaulish ending like Augustodunum, or a Greek ending like Gratianopolis. Clermont, *Clarus Mons*, belongs to a class of names, sometimes picturesque, sometimes pious, which seem to have come into vogue in the eleventh and twelfth centuries. The *Belli montes*, the *Montes fortes*, the *Clari montes* are not rare. So we have *Clari Vallis*, *Casa Dei*, and even such names as *Caritas Virginitas*, *Eleemosyna*. The Normans brought the taste to England — witness our Richmonds, our Beaulieus, our Beaudeserts, and the whole tribe of Cistercian *valleys*. But the names of this kind most commonly used belong to castles or monasteries or to the small towns that have grown up around them. The capital of Auvergne, with its long history, must stand almost alone among ruling cities in bearing a name of this class. But here, too, it is comparatively modern. The capital of Auvergne is perhaps most illustrious for the presence of two renowned inhabitants and one renowned visitor. It is the dwelling-place of Sidonius; the birth-place of Gregory of Tours; the preaching-place of Urban the Second. Now Urban undoubtedly preached at Clermont, but Sidonius was assuredly not known to any man of his own day as Bishop of Clermont. The city ran through the ordinary course of Gaulish nomenclature, and ended with a special finish of its own. It has never been Gergovia any more than Autun ever was Bibracte. Roman taste or Roman policy, possibly the memory of Roman defeat, gave the Arvernian land, like the Æduan land, another capital which could not show the spoils of Cæsar in its temples. The Arvernian town of Nemetum became, as Augustonemetum, a new head of the tribe. Augustonemetum, according to the usual law, became *Arverni, civitas Arvernorum*. By that style it was the bishopric of Sidonius Apollinaris. Then came the fancy name of *Clarus Mons*, the Clermont from which the mighty call went forth to which in those days mens' hearts and swords could answer. Lastly, the bright mounts have become so many that Clermont in Auvergne has come to need a badge to distinguish it from lesser Clermonts in the land of Beauvais and elsewhere. Clermont, with its appendage of Montferrand, Clermont, head of the department of Puy de Mônt, is officially known as *Clermont Ferrand*.

Is Clermont to rank as one of the hill cities? Looking down from the height of Mercury, we are inclined to say, No; we think otherwise during the early part of the road thither. Yet, if the *clarus mons* from which the city takes its later name means the hill on which the city itself stands, we do not wonder that modern French writers have cut down the *mont* into a *monticule*. It may be that Master Wade would not have known — save haply by guessing — what was meant by *monticule*; he might have been better pleased to call it a *tertre*, a word which we have actually found lurking in some of the cities of Northern Gaul. But Clermont does stand on a real hill, a real isolated hill, a hill which no one would despise if it stood either in the land of Chartres or in the land of Ely.

We must not, however, measure its practical height by its scientific height above the sea. We believe that the scientific height of the *monticule* is somewhere about twelve hundred feet, a very respectable height in most parts either of Gaul or Britain. But the whole soil of Auvergne is so high that these twelve hundred feet do make only a *monticule*. And we must remember this fact in estimating much greater heights. The Puy de Dôme is scientifically a good many feet higher than Snowdon; practically it is almost as much lower. Clermont stands a good deal higher above the sea than Lincoln or Durham: but it is not at all a hill city in the sense that they are hill cities; still a hill city it certainly is. There is a considerable ascent from its lowest parts to the highest quarter, which is crowned by the cathedral church. From the open space near that church we may distinctly look down on the lower ground, the ground where we may suppose that men gathered to hear the preaching of Urban, and to listen to the decrees of that great assembly. Still, in such a land as that in which Clermont stands, we certainly look up far more than we look down. We had no Rognon and Puy de Dôme soaring above us at Angiers and Poitiers.

And if Clermont is but in a secondary way a hill city, it is still less of a river city. The Allier, which stands out conspicuously enough in an old view of 1570, seems to have vanished along with the others shown there which are no longer to be seen — the walls, the king and queen's palace, northeast of the cathedral, the abbey of Saint Allyre beyond the walls and the river, and other objects which later havoc has swept away. The stream flows or did flow between the prefecture — once the Cordeliers — and the Place de Jaude, as well as by the treasure of Clermont, the church of Notre Dame du Port. Its course indeed gave the city an approach to the peninsular shape. But we hardly feel that there is a river; it seems almost to have gone the way of London's Fleet and Bristol's Frome. Altogether the city, as a city, apart from its position, its memories, and two or three special buildings, is less interesting than some others. There are some good houses, especially on the way from the cathedral to Notre Dame du Port, but nothing to compare with Poitiers or Limoges. And both houses and churches on the Bright Mount have somewhat of a sombre hue, built as they are of the lava of the neighboring volcanoes, though lava less dull in tint than that of Catania.

On a spot which has such a history as that of the city of the Arverni, we naturally ask whether there are any buildings or other objects left which can have been looked upon either by Urban or by Sidonius? Is anything standing to remind us of the days of the preaching of the Crusade, anything to remind us of the days when the Goth showed himself so good a ruler of his Roman realm? The most instructive building in Clermont, the type of Arvernian Romanesque, the — to a stranger, at least — wonderful church of Notre Dame du Port, may well carry us back to the days of Urban, some parts of it, perhaps, to days earlier still. But there is nothing of an ecclesiastical kind, and not much of any kind to carry us back to the days of Sidonius; there is nothing, for instance, like the baptistery at Poitiers. It is said that not long ago a piece of sculpture of Roman date was to be seen against a house near the cathedral. Nothing of the kind is to be seen now; but there are signs that some houses have been lately pulled down, so most likely it has perished with them. And both in the cathedral itself and in another church, otherwise of no importance, just outside the town, ancient sarcophagi are used for altars. But of buildings within the city of Roman or Early Romanesque date, it is not easy to find anything above ground. But in the suburbs we may, if we look for it, light on one fragment on which the most famous Bishop of the Arvernians may have looked, and which may possibly have been counted among his own belongings. It lies near one of the most frequented parts of the city, and yet it is hard to find. Joanne's guide-book speaks of a piece of Roman wall which he calls *Muraille des Sarrasins*, and which his description led us to think would be a marked object on the way from Clermont to Chamalières, the way to the Puy de

[1] By Dr. E. A. Freeman, in the *Guardian*.

Dôme. Nothing of the kind, however, could we see, nor could any one tell us where this Saracen wall was. But the local writer, Bouillet, spoke of a Roman wall at a place which he called Château des Salles, which seemed to be the same as Joanne's Saracen wall. The Château des Salles was found with very little trouble, with the help of a guide, though the chances are that we might never have lighted on it for ourselves. It is clearly the building meant by Joanne, though it does not stand out by the side of any road, but has to be looked for among courts and alleys leading out of the Place de Jeude at the west end of the town. We cannot help thinking that Joanne confounded its name with that of a fragment in the village of Chamalières. There, there is a Place des Sarrasins, and on one side of it rises a wall which looks like one side of a square keep, and which seems to be part of a castle of the Dolphins of Auvergne. The Château des Salles is partly much later, partly much earlier, than the days of the Dolphins. A good house of the fifteenth century, with one of the characteristic staircase-turrets in the court-yard, has attached to it a large piece of wall, of that kind of construction, alternate layers of stone and brick, which is the common rule in the Roman remains of Gaul and Britain, but of which no distinct example is to be seen in Rome itself. What distinguishes this wall at Clermont from other walls of the same kind elsewhere is a series of attached half-columns, round which the layers of stone and brick are carried. They remind one somewhat of the half-columns of brick in the *Amphitheatrum Castrense*, but they are stouter; they have lost their capitals, and they must be some centuries later. The brickwork of the amphitheatre at Rome is of the earlier days of the Empire, and forms one of the buildings which Aurelian found it convenient to work into the circuit of his wall. This at Clermont can hardly be before the fourth century, and it may be later. It is said that the house to which it is attached belonged to the Bishops of Clermont; and if there is any ground for thinking that it belonged to them in early times, and if anybody chooses to fancy it a work of Sidonius himself, we cannot prove that it is not. We need hardly say that, standing even now in a suburb, it lay far beyond the Roman wall of Nemetum, and formed part of some suburban building, a villa, most likely, of some wealthy citizen, if we cannot assign it to the Bishop himself.

This piece of wall, then, and the sarcophagi, are really all the Roman work, Christian or pagan, which the traveller will find for himself in the city that was Augustonemetum. In the proper home of Sidonius, in the head church of his bishopric, we find as little to suggest his presence, or that of Urban, as we find in the church of Poitiers — in the church itself — to suggest the presence of Hilary. The cathedral church of Clermont is not even an Arvernian church at all. Just like that of Limoges, it is an exotic, though a very beautiful exotic. A characteristic example of French Gothic, we admire it simply as a work of art. It has not, like the older church of Notre Dame du Port, any special propriety in the city in which it happens to stand. Built on Arvernian soil, it is purely French, and it might just as well have stood on any other spot of the wide space which came within the range of French dominion and French taste. Historically it proves nothing, except the fact that when it was built French artistic taste had thoroughly established itself in Auvergne. The church is typically French, and brings out most of the points in which a French minster differs from an English one. In other words, it is short and lofty, with western towers, but no central. It does not at all belong to the first rank of French churches in point of scale, either in length or height. In England it would come very low down indeed in point of length, while in point of height it would rank, we imagine, third in all England. Here is a church, perhaps of the length of Tewkesbury, rising higher in the air than any minster in England except Westminster and York. We need hardly say that it has the apse and surrounding chapels; it will surprise no one to hear that it was designed for six towers, and that none of the six marks the crossing of the four limbs. Nor will it surprise any one to hear that, of these six towers, five, and among them the two chief ones, remain unfinished to this day. All this means simply that it is distinctly and thoroughly French, and to say of a minster of this date that it is distinctly and thoroughly French is to say that it has an internal effect of its own kind, with which no English minster can compare. France is — we are speaking of Gothic churches only — as distinctly the land of perfect internal effects as England and Normandy are the lands of perfect external outlines. Clermont Cathedral has a better effect at a distance than it has when we come near. The short and lofty body, with its two western towers, looks well from most points. The spires, as we have already implied, are still unfinished, and oddly enough, the scaffolding which still surrounds them gives them, at a little distance, something of the effect of tapering towers like those of Tours and Orleans. In the distance the transepts are lost, and when we come near, they certainly are no improvement within or without. It is very difficult to treat a transept on the French plan where there is no mid-tower. Within, the church is of extreme beauty. We can sit and gaze with delight; but when we come to criticise, it is hardly so satisfactory as the admirable building at Limoges. The two are so near in style and scale that a comparison between them is easy and fair. At Clermont the triforium is not so skilfully managed as at Limoges. There is a kind of canopy over the arches, which seems out of place, and the transepts do not strike as a special feature in the way that they do at Limoges. There they have a character; here we simply think that they are wide and shallow, put there mainly for the purpose of building towers against them which have never been finished. We are tempted to wish them altogether away, as at Bourges. Yet Clermont cathedral is, inside at least, a graceful and lovely building, only it is not what we came to see in Auvergne. What we did come to see is to be found in the other great surviving church of Clermont, the collegiate church of Notre Dame du Port. But that, the model in some sort of Arvernian art, must be taken in its own place along with its fellows, as a study of a most marked form of local art — one which, we can have little doubt in saying, is far more instructive and far more attractive than that which we lately studied in Anjou.

THE WASHINGTON MONUMENT.

Brookline, Mass., February 17, 1885.



The completion of the Washington monument by the setting of the last stone at the apex in December, 1884, was an event of no small significance. There were many engineering features in connection with the erection of the obelisk which challenge attention. One of the principal difficulties was with the foundation, the portion of a structure about which an engineer is particularly solicitous. The top of the monument as it now stands is 555 feet above its base, which, exclusive of its concrete foundation is about 55 feet square. The total cost has been something over $1,100,000, a considerable amount to expend on so small a horizontal section, if that alone be considered.

The old Washington Monument Association had erected between the years 1848 and 1856, 156 feet of the obelisk, and for twenty years nothing more was done upon the structure. In 1877, the whole property was turned over to the United States. Plans were at once made by Colonel Casey of the Corps of Engineers for completing the work, and the undertaking from that time to the present has been pushed with comparative enterprise, and certainly with no little skill. The original height designed by Robert Mills was 600 feet, but on careful examination of the foundations it was found by the engineers in charge that there was not sufficient area of base to give a confident assurance of stability. The question then arose as to whether it would be better to underpin the structure, or to build a massive wall enclosing the earth about and under the base, so as to reduce to a minimum the chances of lateral displacement of the particles when subjected to the enormous weight of the entire projected masonry. The plan of underpinning was finally adopted, and this was principally carried out by the liberal use of concrete extending under and around the old foundations. The original depth of only eight feet was increased to thirty-six feet, partly by raising the level of the earth surface so as to cover the concrete buttresses, and partly by lowering the new foundation. This portion of the work was successfully completed in 1880, and then the work of carrying up the super-structure was vigorously pushed.

The weight of the obelisk at this time was about 31,000 tons. In the process of underpinning, nearly half of the old rubble-work had to be torn away, which was of course done in sections, and forty-eight per cent of the area of the shaft was undermined. The new foundation is 126 feet square, and covers 16,000 square feet against 6,400 square feet of the original plan. The walls of the obelisk are about fifteen feet in thickness at the lower levels, and they taper to one and one-half feet at the top. The exterior is composed of white marble, from a quarry in Maryland, and the backing is of gneiss and granite. The shaft is 34½ feet square at the top, and the pyramidion which surmounts the walls is 55 feet in height. The planning of this apex involved the expenditure of no small amount of thought and skill. At first it was intended to roof over the top with a frame-work of iron, with glass to light the well in the centre, but as finally built this portion of the obelisk consists of a series of twelve light arched buttresses of marble on the inside which spring from a point in the walls 85 feet below the apex. These buttresses support slabs of marble on the outside which form a smooth covering, and give an appearance of solidity from the exterior. In reality the covering stones are but seven inches in thickness.

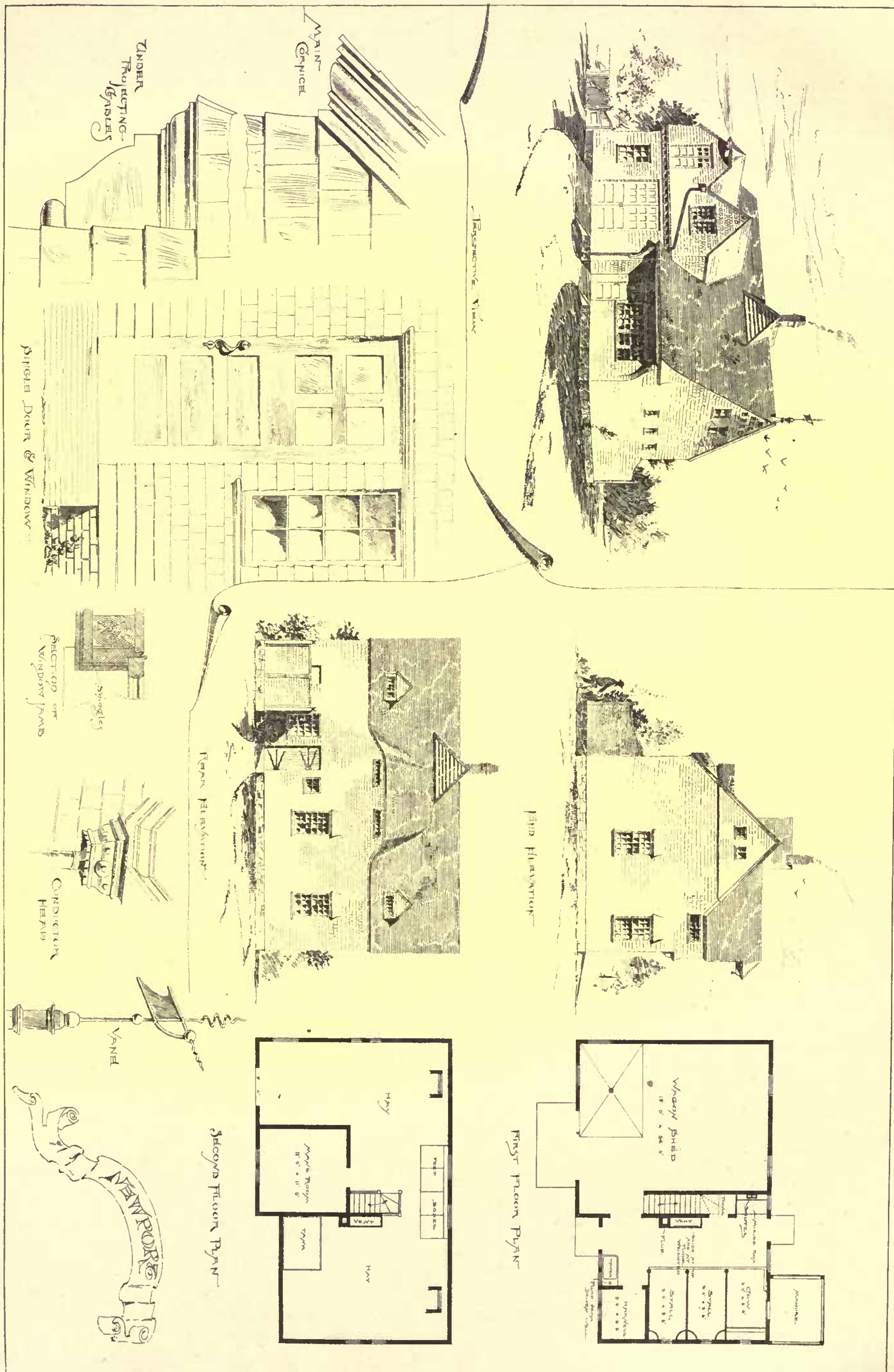
Above the point 452 feet from the base, the veneering of marble runs through the walls to the well. The latter contains an elevator and staircase.

It may be of interest to compare the height of the Washington monument with the highest structures in the world. From Haswell we take the following table: —

HEIGHTS OF TOWERS, ETC.

Pyramid of Cheops	520 feet.
St. Peter's	518 "
Cologne	501 "
Balbec	500 "
Strasbourg	486 "

It will thus be seen that the Washington obelisk outranks all the rest.

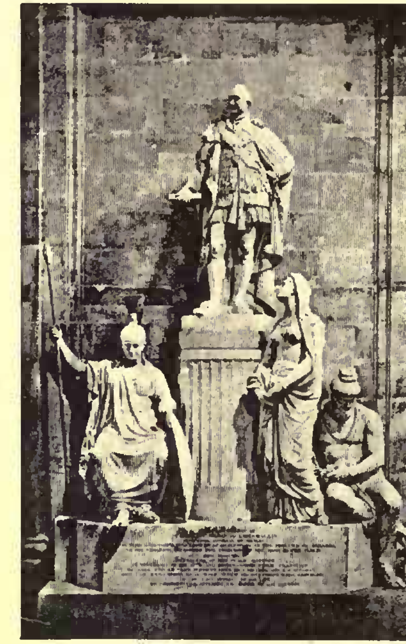


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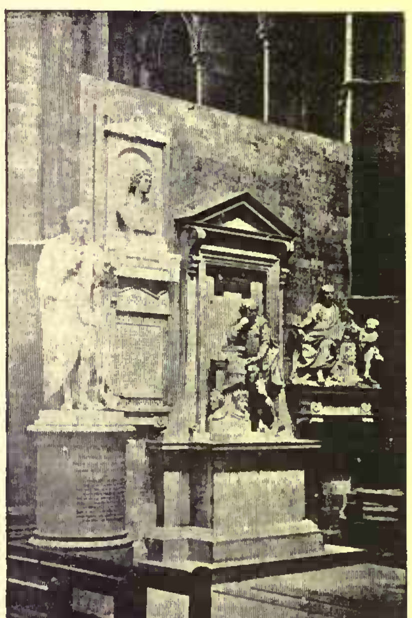

LORD PALMERSTON, WESTMINSTER ABBEY. JACKSON, SCULPTOR.


THE FIRE MONUMENT. SIR CHRISTOPHER WREN ARCH'T


ELEANOR'S CROSS. CHARING CROSS. RESTORED BY E.M. BARRY ARCHITECT.


THE POETS' CORNER, WESTMINSTER ABBEY
CAMPBELL, MARSHALL, SC. SHAKESPEARE, SCHEEMAKERS, SCULPT.

LONDON MONUMENTS AND STATUES, No. 4.

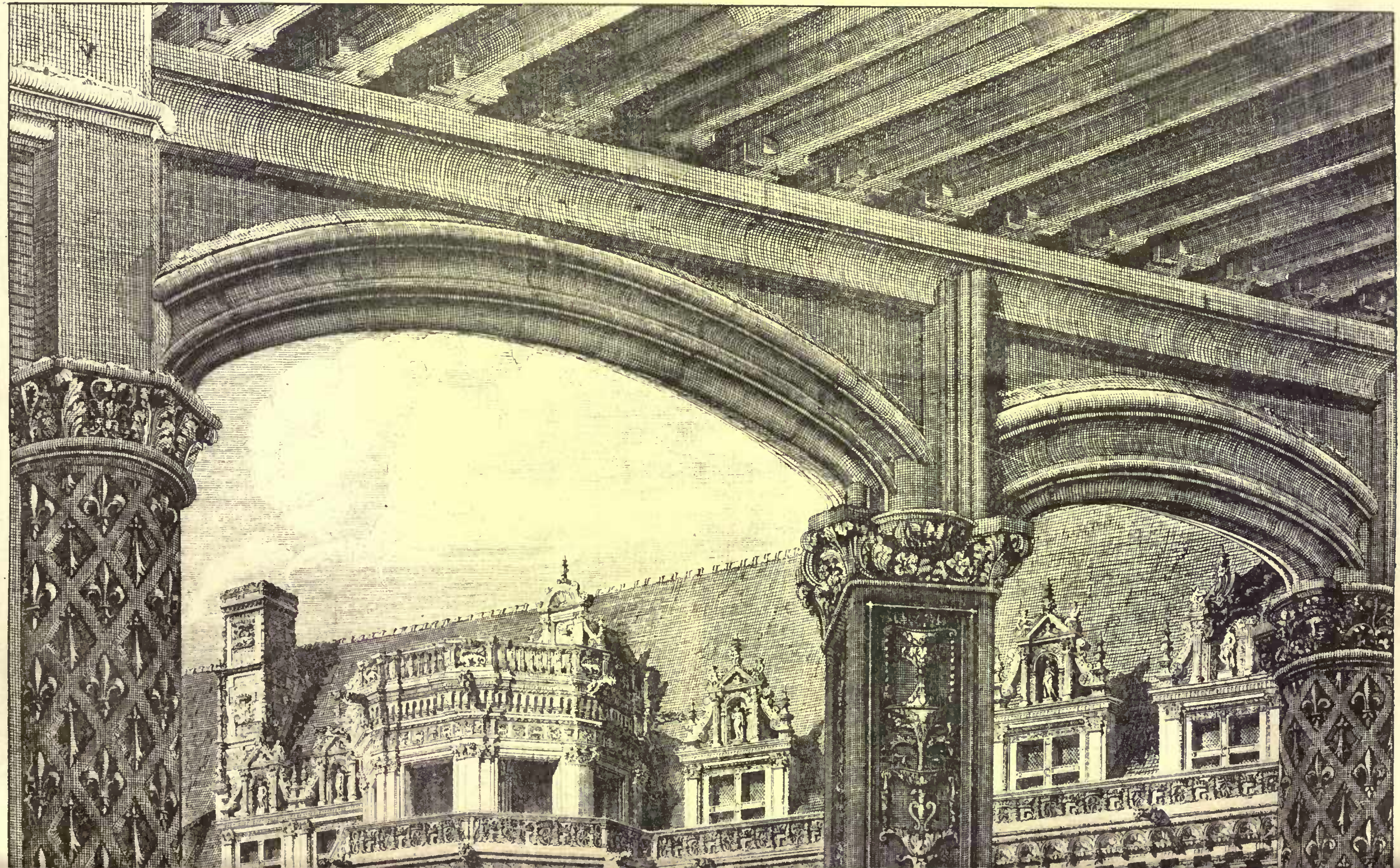

MONUMENT TO CORNWALLIS, ST PAUL'S CATHEDRAL
ROSSI, SCULPTOR.

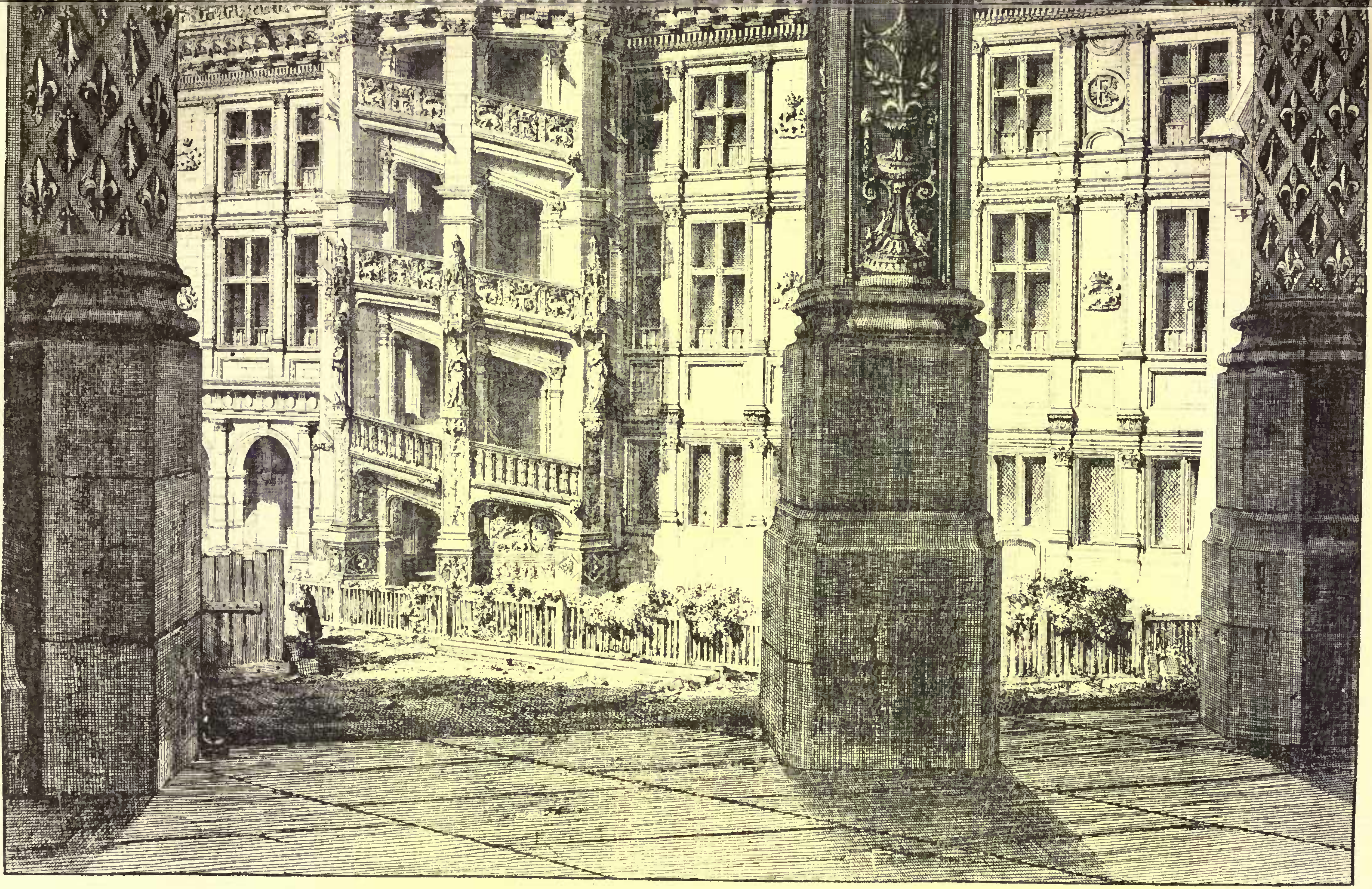

TRAFALGAR SQ. STATUE OF CHARLES I. LE SUEUR, SCULPT.


WEST FRONT, ST PAULS' CATHEDRAL.
STATUE OF QUEEN ANNE IN FOREGROUND, BIRD, SCULPT.


SIR JOHN FRANKLIN, WESTMINSTER ABBEY.
NOBLE, SCULPTOR.

PHOTO CAUSTIC. HELIOTYPE PRINTING CO. BOSTON.



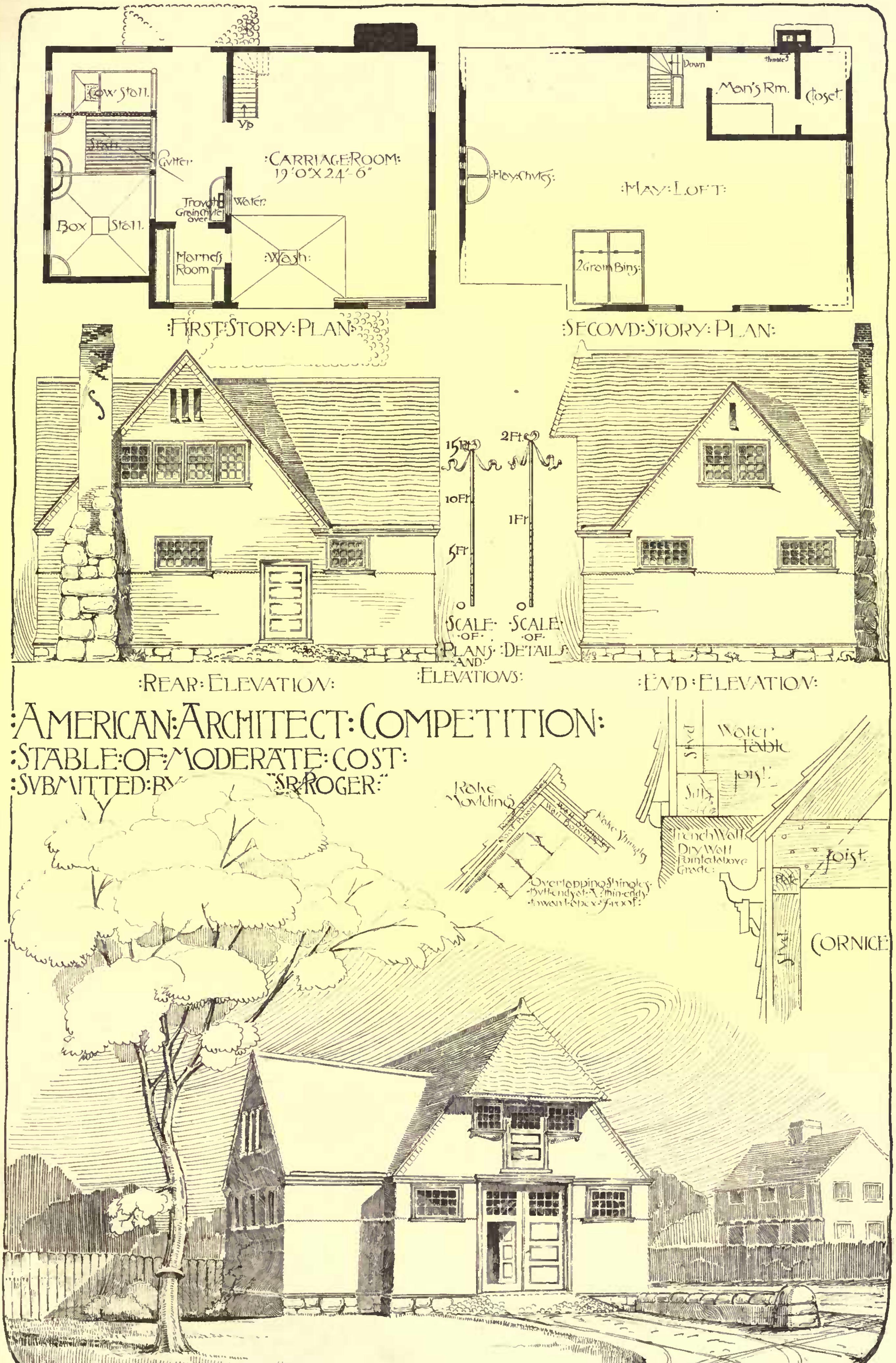


HELIOTYPE PRINTING CO. BOSTON

GRAND STAIRCASE OF FRANCIS I. CHATEAU DE BLOIS.



HELIOTYPE PRINTING CO. BOSTON



HELIOTYPE PRINTING CO BOSTON

The present total weight of the obelisk with foundations and earth resting thereon is 81,000 tons. The weight of the shaft alone is about half this amount. With a strong wind blowing against one side, it it estimated that the final pressure on the earth under the foundation nowhere exceeds nine tons per square foot. During the work of underpinning the settlement was about two inches, and the total settlement has been about four inches since the work of rebuilding began, which may be considered a most satisfactory condition of affairs. An account of the settlement at each of the four corners of the monument was kept as the work proceeded, and the maximum difference was about one-sixteenth of an inch. By careful calculation and manipulation it is possible to handle as large masses as this towering weight of 81,000 tons with success, but such work can be trusted only to those whose experience and accomplishments fit them for the work. While there may be in the minds of many a question as to the propriety of expending so large an amount of money on a structure, which has in its design so little artistic merit; still we think no one will question the propriety of completing the obelisk after it had once been begun. As it existed in 1876, the Washington monument simply commemorated the undertaking of "too big a job;" as it stands to-day, it is as well a monument to the skill and enterprise of the American people, as to the nobility of the name which it perpetuates.

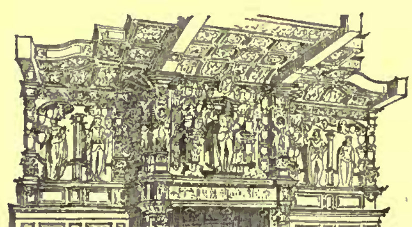
DESMOND FITZGERALD, M. Am. Soc. C. E.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

CHIMNEY-PIECE IN THE COUNCIL-CHAMBER OF THE PALACE OF JUSTICE, BRUGES, BELGIUM.

[Gelatine Print, issued only with the Gelatine Edition.]



THIS superb and unique specimen of Renaissance sculpture, occupies nearly the entire side of the room. It is Flemish work of the sixteenth century, and was executed between the years 1529–31 to commemorate the Battle of Pavia, the Treaty of Madrid, and the Treaty of Cambrai (the "Ladies Peace.") Sculptured from the designs and under the direction of Lancelot Blondeel of Bruges, a Flemish painter and architect (who flourished 149-—1561), it is the work in the main of Guyot de Beaugrant of Mechlin (14-—155-). He carved the five principal statues, which with the rest of the upper portion are in oak; the frieze in alabaster representing the story of Susanna; also the four genii placed at the lower angles and the chimney proper, which is in black Dinant marble. In the accessories of armorial bearings, foliage, grotesques and so forth, he was assisted by other hands. The chimney was restored in 1850, by the sculptor Geerts of Louvain. The tapestry on the walls was manufactured at Ingelmünster in 1859, in imitation of the original, fragments of which were found in the cellar of the building. The upper portion is divided into three compartments. The central statue which represents Charles V, is, like the other four, nearly of life size. On the right of the Emperor are Maximilian and Mary of Burgundy, his paternal grandparents, and on the other hand Ferdinand of Arragon and Isabella of Castile, his grandparents on the mother's side. The pilasters are decorated with medallions of his parents, Philippe le Beau and Jeanne la Folle, and elsewhere appear portraits of Lannoy, the conqueror of Pavia, Margaret of Austria, Francis I and Eleanor of Austria, with the arms of Spain, Burgundy, Naples and Navarre. Above the head of Charles V are seen the imperial arms encircled with the collar of the Golden Fleece, and surmounted by a helmet bearing an imperial crown, over which is the Gallic cock.

Our print is reversed from the original, and shows but the central part of the chimney-piece, including on the right the statue of Maximilian. The initial cut, however, gives the whole of the work in outline. A plaster cast of this *chef-d'œuvre* is in the eastern section of the architectural court in South Kensington Museum, the south court of which bears on its wall, with other mosaic portraits of eminent art-workers, one by F. W. Moody, of Lancelot Blondeel, the designer of this chimney-piece. It was possibly intended to decorate the original in colors, and to add inscriptions to the cartouches.

COMPETITIVE DESIGN FOR BARN SUBMITTED BY "*Newport.*"

THERE is no cellar under barn; stone walls to be eighteen inches thick, carried three feet six inches below grade, and above grade to be neatly pointed. Barn to have mortised and tenoned frame, braced above and below at all angles; to be covered with good merchantable spruce sheathing, and with plain pine shingles laid with five inches to the weather. Inside of barn to show studs and outside sheathing. The water for the barn is obtained from a large tank on the second floor supplied from the roof; also from a pump connected with driven well. To be a large box flue, as shown, for ventilation, built from floor of stable to ventilator on roof. The chimney-flue is carried in this, and its heat contributes to increase the draft. To be chutes from the feed-boxes to the mixing-box directly beneath. The manure pile is kept from view by a high shingle fence, the rear of which is hinged in two leaves. The floor of stalls and of washing-table to be of Portland cement: to be a bed of concrete four inches thick between the joists resting on flooring cut in between joists, and cement to be two inches thick on top of this bed; gutters and slopes to be formed in the cement. Stalls to be floored above cement with a frame of 2″ x 4″ yellow pine slats, placed one-half inch apart. Estimate of cost; mason-work, $225; joiner-work, including tinning, well, stable fittings, etc., $1,200; total cost, $1,425.

COMPETITIVE DESIGN FOR BARN SUBMITTED BY "*Sr. Roger.*"

BUILDING constructed of spruce throughout: shingled on roof and outside walls; sheathed walls and ceiling, and plank floor in first story; man's room plastered; hub-guard around carriage-room. Finish painted three coats; sheathing oiled, and shingles dipped in brown petroleum stain. The drain from stalls is to connect with manure heap in rear, and the drain from carriage-wash is to connect with loose cesspool. The author holds a signed bid dated December 20, 1884, to the amount of $1,500.

THE GRAND STAIRCASE OF FRANCIS I, AT THE CHATEAU DE BLOIS, FROM AN ETCHING BY DE ROCHEBRUNE.

IN a fine poem addressed to Louis Blanc by Victor Hugo, the beautiful chateau ill-famed for the assassination of the Duc de Guise, is aptly apostrophized as

> "black and strong,
> With blood upon its front and all along
> The tower eight-sided, where are Gorgon heads
> Agape."

This widely-known work of the sixteenth century M. de Rochebrune has etched with a rare appreciation, the lavish and richly delicate carving of the staircase shining bright through massive dark arches in the foreground of the plate. Its numerous statues and medallions and the constantly recurring F (the initial of Francis I) with his badge of a salamander in flames beneath a crown, as lately restored, are etched with a precision that is admirable.

Octave Guillaume de Rochebrune was born at Fontenay-le-Comte (Vendée) and has won three medals for etching, also the cross of a Chevalier of the Legion of Honor. Hamerton says he is an artist of noble birth, who has the good fortune to live in one of the grandest of the old French châteaux. His etchings are usually, like the one we reproduce, of very large size, and among them are the châteaux of Chambord and Meillant, of Pierrefonds and Ecouen, the Louvre, the Hôtel Cluny and the Cathedral of Strasbourg. Two of his works represent with strength and effectiveness features of his own studio of Terre-Neuve at Fontenay: one its sumptuously carved chimney-piece and the other its doorway, both constructions of great size and magnificence. The former print was reproduced in the *American Architect* for October 9, 1880.

M. de Rochebrune's plates are too little known outside of France, and we are pleased to be enabled to present one of his best to our readers in this reproduction.

THE MONUMENTS AND STATUES OF LONDON. — PLATES IV AND V.

FOR descriptions, see article elsewhere in this issue.

THE *AMERICAN ARCHITECT* STABLE COMPETITION. — II.

THE JURY'S AWARD.



Statue of William I of Holland at Luxembourg Belgium. by Mercier

"*TOM PINCH II.*" — The plan is the best presented, resembling that by "*Doris,*" but is better: compact, without waste room; with the different rooms of proper and ample proportion; convenient platform for drying bedding; cow-shed separated from stable-room; ample room for grooming horses in stable-room; wash-floor in the right place. Details simple and good. The chief objection to the exterior design is the tower ventilator in its grouping with the heavy overhang above the door. The composition of these two motives lacks simplicity, either one of them alone would have been

simple and good, together they are too sensational for the rest of the design. The line dividing the wall from the gable would have been better lower. The rendering seems hurried, and lacks shadow, especially in the windows.

"*Candle-light.*"—The plan is good: compact and without waste room; the waste room however, comes in abundance in the roof, which for the sake of the artistic effect of a gambrel roof is carried considerably higher than is necessary. This with the brick first story makes the building expensive. There is no ventilation beyond what is gained by doors and windows. The design is that of a trained and skilful designer. The rendering is excellent, has more sketchy freedom and knowledge of what to do than any other presented. The details, though not given, can be seen by the perspective to be good throughout; and the proportion of the divisions of wall and roof are very well studied. The dormer is very interesting without being fussy, and the whole design, though probably better in the sparkling black and white rendering than it would be in the two tones of brick and shingle is very well studied and thought out. A view from the rear with the long pitch of the gambrel nearest the eye would not be nearly as happy as the view taken.

"*Rye.*"—Evidently the work of a beginner, but work of a very good character. The plan is simple and good. In the second story the stairs land too near the hay chutes, a defect easily remedied by turning them forward with winders. The details show need of study both in construction, and in character and use of mouldings. The cornice or rather eaves would look very thin. The water-table also needs strengthening. The gable in rear with long and short pitch would be disagreeable in perspective, though looking well in elevation. The rendering, especially, shows the work of a young hand, in the perspective more than elsewhere. The use of corner-boards carried only as high as the shingle frieze is an example of a good effect obtained by simple means. The overhang to hay beam is exaggerated too much in the perspective. The vane could have been omitted. This stable is well within the limit of $1,500.

"*Hope I.*"—The plan is fairly good. The carriage door should be moved to the right to allow standing-room for carriages. The outside entrance to stable-room is of no special value with a porch outside, as it cannot be used for the horses. The harness-room should not open into the stable-room alone, as the reek of a stable in such case injures the harnesses. The mass of the exterior is excellent, symmetrical and simple. The ventilator is particularly good. The porch, good in itself, does not seem an integral part of the building; but resembles a small pavilion butted against the stable. If the roof had been a hood starting from the moulding below the shingle frieze, the result would have been less incongruous; but the porch seems to be more in the way than of use. The details are excellent, show refinement and appreciation of the value of projections and sharp forms. The rendering of the perspective is very good indeed, of the plans poor, and the lettering and mounting of the paper is particularly poor. This stable is well beyond the limit of $1,500.

"*Hay-Foot Straw-Foot.*"—This design shows the work of a good draughtsman. The plan is good, but larger than is necessary. The water-closet is a luxury hardly warranted in a $1,500 stable, and there is waste room in the stable-room. The harness is in an inconvenient place. The shed is of positive value. There are no hay-chutes from second story, and it is doubtful if they could be put in and be practicable, as they would necessarily follow the pitch of the roof which is less than 45°. The general mass is good and sufficiently varied to be interesting. The detail is simple and good. The rendering (excepting the foliage) is excellent, clear, direct and attractive. It is possible that this stable may be within the limit.

"*Hostler.*"—In this design the exterior has been impoverished in mouldings to allow features in the plan that will give effective combination and shadows, but which in themselves are of little benefit as far as utility is concerned. The porch in front of stable-room is one of these effective features. This method of designing is one of the best possible in large buildings, but the result in so small a building as this stable, is to make it look cheap and thin. The design shows the work of a skilful draughtsman. The plan is fairly good. The carriage-room, if there are carriages already in it, will not allow another to be driven in, but it will allow the horse to enter and the carriage to be protected under the porch, to be wheeled into the carriage-room after the horse is unharnessed. The feeding passage is a luxury. The cow-stall should be entirely separated (except access by a door) from the stable-room. The exterior is good in mass, but poor in details; there is not a moulding or projection of any sort except the hood over man's window, and eaves of porch and hay-beam projection. The rendering is so excellent, so seductive that it does more than justice to the design, and disguises the thinness.

"*Spurs.*"—The plan is good, resembles that by "*Rye,*" and is subject to the same criticism. The mass of the stable is simple, but too strongly suggests the idea that it is a slice of a building of indefinite depth. This effect is caused by the main roof having a longer rake than ridge, and both front and rear being so nearly alike. The details are simple. The rendering is good, but lacks shadow. The scratches that frame the perspective could have been omitted.

"*Inconnu.*"—Plan is good. Harness-room a little inconvenient in relation to stall-room. Exterior mass simple and good. Dormer over hay-loft not in keeping with the rest of the design. False gable over entrance not worth doing. Hay door too close in under rafters for convenience. Details simple. Rendering good, straightforward and clear, perhaps a little too evenly drawn on all surfaces, regard less of the presentation of their planes to the light. Landscape not well drawn.

"*Old Colonial.*"—Plan fairly good, but expensive; so much room for feed is unnecessary. Feeding the horses with hay from behind them is inconvenient. The direct access to the stable-room is good. The charm of real old Colonial work is in its classical symmetry, and in its delicate and refined detail. This design has the symmetry, but the fine detail it has not. The cornice lacks projection and depth. The proportion of space between shed cornice and main cornice is relatively too high for the wall below. The lantern needs pilaster treatment in its uprights, and also an entasis, which perhaps unconsciously has been given in the perspective.

"*Newport.*"—In the plan, it is rather inconvenient to lead the horse back into stable after unharnessing. Cow-stall should be separate. Harness-room will be close. Mass of design good, all under one roof. Double gable unnecessary, one would have been better. The combination of ventilator and chimney particularly unhappy in design, as is also the lift in roof on rear to allow head-room above feed-boxes. Detail good, refined and strong. Rendering excellent.

"*Simplicity II.*"—In plan the stalls are rather far from the carriage-room, otherwise the plan is good. The building has a simple roof and mass. The loggia in man's room is a luxury and a snow-trap. The peak above hay-door is eccentric, and the ventilator uninteresting in form. The rendering seems timid, but is careful.

"*Caius.*"—There is waste room in the stable-room and in the carriage-room, otherwise the plan is good. The exterior has too many motives. The harness-room bay is unnecessary, and not attractive; the scale of glass openings in the window above as compared with other windows is much too large. An arch in shingles is unsatisfactory; it is much better to treat it with mouldings. The detail is thin. The rendering is good.

"*Mott Haven.*"—Waste room in first story-plan. Cow-stall should be separate. Stableman's room too large. Harness-room in inconvenient place. Exterior mass good. Details simple. Rendering careless, and not doing justice to the design.

"*Gambrel.*"—Waste room in stable-room, expensive plan. Exterior: hay-door gable would have been better if carried up flush with wall below. Proportions of gable need studying. Gas-lantern window, though convenient, of bad proportions; ventilator unsatisfactory in design. Details simple. Rendering clear.

"*Reason.*"—Plan compact. Harness-room would be close; mass simple, walls too high for roof. Ventilator needs study. Outside chimney could have been carried inside and would have looked better so. Detail simple. Rendering correct, but unattractive.

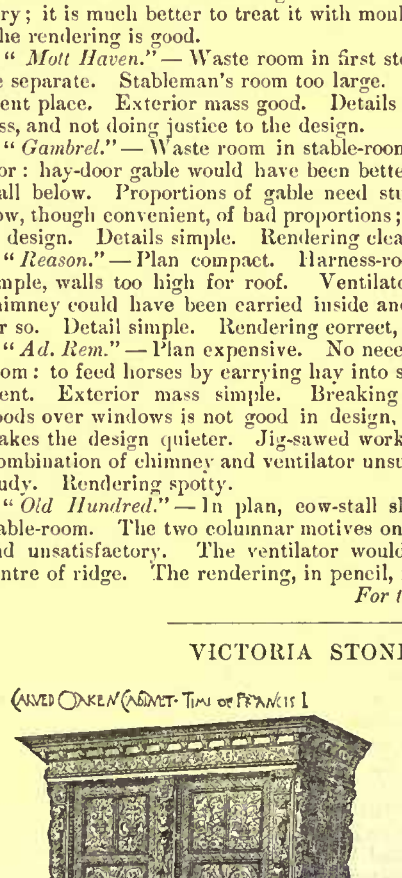
"*Ad. Rem.*"—Plan expensive. No necessity for so large a feed-room: to feed horses by carrying hay into stall from rear is inconvenient. Exterior mass simple. Breaking the belt-course to make hoods over windows is not good in design, a continuous line always makes the design quieter. Jig-sawed work under sills unnecessary. Combination of chimney and ventilator unsuccessful; ventilator needs study. Rendering spotty.

"*Old Hundred.*"—In plan, cow-stall should be separated from stable-room. The two columnar motives on exterior are unnecessary and unsatisfactory. The ventilator would have been better over centre of ridge. The rendering, in pencil, is fairly good.

For the Jury, C. H. Walker.

VICTORIA STONE.

CARVED OAKEN CABINET · TIME OF FRANCIS I



"Necessity is the mother of invention." It is an old maxim, but like history, it continually repeats itself. The growth of our towns and the demand of the people for well-paved streets have led to the discovery that natural stone is limited in the supply, and that, if we are to have our streets well paved, we must resort to the inventive faculty, the exercise of which is the result of compulsion by our stern mother "Necessity." It is of no use calling-in the celebrated apostrophe of Liston, "York, you're wanted." York stone comes sluggishly and very independently to a distance from its native quarries; nay, more, it is expensive, and if parish surveyors had any hearts they would be broken as certainly as the purses of the owners, who are now compelled to pay under the very celebrated section 105 of the Metropolis Local Management Act, and the equally stringent section 150 of the Public Health Act. These

two sections have levelled all distinctions between the metropolis and the provinces. Under their operation the old-fashioned natural earth and gravel footpaths are doomed to disappear. Tar paving has been interposed as a temporary expedient, but when we come to the permanent paving of footpaths, thereafter to be repairable by the inhabitants at large, we have to contemplate the necessity of filling up a great void between this and York stone.

The application of the principle applied to the production of concrete has led to the discovery of an artificial stone as hard and as enduring as York, in slabs prepared in exact sizes, and capable of being easily laid down, without the irritation of the everlasting chip, chip, chip, of the mason's hammer during the process of what is known as "squaring." Very recently we had the opportunity of witnessing day by day the process of laying down 10,000 feet of Victoria stone in Waterloo Road and its neighboring streets in the parish of Lambeth. When a surveyor of the great experience and practical judgment of Mr. Hugh Macintosh, of Lambeth Vestry, approves of an artificial stone, we cannot help feeling that the days of York are numbered. The pavement in Waterloo Road attests the value of the process, by which we now accelerate the intentions of nature by a few thousand years. Nor is the process very wonderful when it comes to be examined, and when once the central idea is correctly understood.

Columbus found it very easy to make the egg stand on end, although it was a performance difficult enough to the prelates and monks to whom Columbus propounded the problem. The inventor of Victoria stone took Mount Sorel granite chippings, formed them into a concrete, and when this was properly set, put the mass into a cold solution or bath of natural silica. The impregnation of the silica caused the mass to petrify, so that which was a concrete became stone. There is no other word for it because the character of stone is surely attained by that which requires a crushing power of 6,441 lbs. weight per cubic inch to pulverize it in the same degree as 5,851 lbs. will do for the best York.

The simplicity of the process is not, however, to be confounded with the common concretes in connection with silica. Only the best Portland cement is used in the production of Victoria stone, and the broken granite is very carefully washed in order to procure uniformity in the stone. The moulding of the slabs has also to be very carefully attended to, in order to secure perfection in jointing them together when they are laid down in streets. Any one who will walk down the east side of Waterloo Road will observe that the ends and sides of the slabs are equally level, and the edges being perfectly true, are joined with as much accuracy as parquetry in the floor of a drawing-room or the hall of a palatial mansion. The risk which always attends the "squaring" of York is thus avoided, and the unsightly irregularity of joints completed by mortar is thus impossible with Victoria stone. Before, however, the Victoria is thus laid down the slabs are put into the silica bath, where they remain for eight or ten days, and thus we have a block into which water cannot penetrate, and which is non-porous. Lastly, the slabs are exposed for a month, at least, to the air before being used in paving or otherwise, for it is not alone to paving that Victoria stone is exclusively applied.

We saw at the Agricultural Hall Building Exhibition in 1882, a flight of spandrel steps which are in use at Mile End Infirmary, the panelled window-head, nine feet long, at the same institution, and railway-platform copings three or four inches thick; a paving-slab which had stood five years' heavy traffic at the corner of Commercial Street, and two pieces of stone which had stood eleven years of traffic in Upper Street, Islington, showing no appreciable wear. At the well-known factory of Messrs. Peek, Frean & Co., may be seen thirty-six external panels in the clock-tower and chimney-stacks. Slowly but surely the utility of the stone has approved itself to the judgment of responsible persons capable of rising superior to prejudice, and who are able to get rid of the antiquated forms of thought in public affairs.

In and around London, district Boards, Vestries, Local Boards, Improvement Commissioners, and Sanitary Authorities, as well as great manufacturers have adopted Victoria stone. All these authorities have been advised by competent surveyors who are not likely to err in any large number, and for so long a time as the number of years in which Victoria stone has been extensively used.

When, in addition to all this, we find railway directors, wharfingers, military authorities, managers of asylums, infirmaries, and schools, as well as bakers and brewers, agreed upon using the stone, we are prepared to expect that it is found suitable for cattle-troughs, sinks, cisterns, copings, caps, window and door-sills and steps, and staircases of any shape or size. Its strength, hardness, and endurance must have been attested by competent authorities, who not only pay out of public moneys, but at their own trade charges, for a material which they prefer to others that have long held a high reputation. Any one having good reason to inquire may easily satisfy himself by a visit to the Groby Quarries, in Leicestershire, or to the works of the company, near Stratford Market Station. Intelligent and thoughtful persons will be able to add a chapter to the revelations of Hugh Miller, if they carefully follow the processes of blasting in order to obtain the granite, the washing by machinery to cleanse it from all earthy and deleterious particles likely to interfere with the subsequent processes of moulding and mixing with an ascertained quantity of Portland cement before being placed in the moulds. The moulds are metal-lined, and of the usual sizes for paving-slabs. They are filled by hand labor, which, it is curious and instructive to find, is more accurate than steam-machinery. Then the concrete is taken to the bath, which may be described as the very reverse of the Roman or Turkish bath, for that is employed to open the pores by heat. For about ten days the slabs are immersed in silica or flint dissolved in caustic soda, and petrifaction is complete. We have now a square stone with two smooth sides, for Victoria stone is like an old coat made of West of England cloth, which may be turned when the nap is gone. Thus, while York stone in the course of time presents a groove between the wall and the kerb, Victoria stone can be turned, and re-presents to the eyes of the ratepayer a smooth surface at the cost of relaying; no mean advantage in these days, when the cost of paving is so heavy an item in municipal estimates. Happily the Local Government Board has removed one very great difficulty, and it is now possible to obtain the necessary official sanction for loans for paving with Victoria, as with York stone. The endurance or permanence is, as far as our experience extends, equally applicable to both forms of paving. The comfort of the inhabitants in streets undergoing the process of being paved is largely promoted by the comparatively silent process of laying slabs without the irritation of the operation technically called "squaring," but which is by no means dealing with your neighbor "on the square."—*Sanitary World.*

"AN ARCHITECT'S SUIT."

Minneapolis, Minn.

To the Editors of the American Architect: —

Dear Sirs, — Please permit a reference to "An Architect's Suit," in your Notes and Clippings of February 7. Many of your readers who knew Mr. Wilson to have been only a few years ago doing some of the largest and very best work in the country were doubtless pained to see the paragraph given such a place. The report may have been true in every particular, but chancing to have been present at a good part of the trial, I certainly believe I heard testimony to the following effect: —

By Mr. Wilson, admitting a contract price for the work done by him (a less sum than $840) and no testimony to show value of services.

By each defendant, admitting this contract price, but alleging a further clause that all claim for services to be forfeited in case the building cost more than $20,000.

By Mr. Wilson denying this clause.

Thus far one against two.

By a builder — one of the most aggressively honest appearing men ever put upon a witness stand — swearing that Mr. Wilson told him he would not get a cent unless he could get it built for $20,000, and that he (the builder) made no bid, as he figured it up to $28,000, several items being still lacking, and that the total would be still higher.

Document (original) being a bid signed by this same builder for the building in question, complete, for the sum of $22,500.

I am positive that little if any other testimony was taken, and that all of importance is mentioned above.

Yours, etc., Frederick G. Corser.

CONTENTS OF SOME PARIS LIBRARIES.

Rome, February 3, 1885.

To the Editors of the American Architect: —

Dear Sirs, — In the article entitled "Some Smaller Paris Libraries," through some mistake of myself or the printer, the number of volumes in the Bibliothèque St. Geneviève is put at one million two hundred thousand, while those in the Arsenal are estimated at four million five hundred thousand. The numbers should be one hundred and twenty thousand and four hundred and fifty thousand respectively. Will you kindly make this correction, and oblige,

Yours truly, C. H. Blackall.

A QUESTION OF ROYALTY.

Washington, D. C., February 9, 1885.

To the Editors of the American Architect: —

Dear Sirs, — I see two pages of the last issue of the *American Architect* (February 7) devoted to a patent fire-proof construction of C. L. Staub. More than five years ago, in the Model School-House Competition of *The Sanitary Engineer*, I designed doors to be made in the manner shown and described by Mr. C. L. Staub in his Letters Patent. I enclose you a tracing from the drawing designed in December, 1879, and made in January, 1880. Submitted to committee February 2, 1880. The principle is sheet metal between two thicknesses of wood. In doors three thicknesses of wood, two of metal. Now suppose I or the public should desire to use this method of fire-proofing, would we under the circumstances have to pay a royalty? I having invented and drawn the design more than two years before Mr. Staub filed his application for a patent.

Yours truly, Glenn Brown.

[The fact that you conceived a style of building identical with that of Mr. Staub does not affect his patent, as you say your idea was only embodied in an unexecuted competitive design.— Eds. American Architect.]

Duties on Works of Art. — A meeting of American artists was held at Rome, February 15, at which Mr. Story presided. A petition to Congress was prepared, asking for the abolition of duties on works of art imported into the United States.

NOTES AND CLIPPINGS.

Our Forests a great Interest.—The value of the products of our forests in 1880 exceeded $700,000,000. The value of the iron and steel produced that year was less than $300,000,000; of coal, both anthracite and bituminous, less than $100,000,000. But the forests are not only valuable because of their products, which are greater than any single crop, greater than corn, or wheat, or cotton. They are of inestimable value for their influence upon the climate, on which all agriculture more or less depends. And yet it is almost impossible to get anything done by Congress to secure the preservation and proper economic management of our forests, while the duty on foreign lumber, the effect of which is to hasten their destruction, is retained, against all the teachings of science and experience.—*Boston Herald.*

Queen Eleanor's Cross, Northampton. — Queen Eleanor's Cross near Northampton, England, was made by John de Bello between 1291 and 1294. It is one of many crosses in different places having the same name, most of which have perished. In 1762 it was "restored" into a memorial "of a very different personage, and a tablet with a long and pompous inscription, recording all the glories of the reign of Queen Anne and the loyalty of the gentry of the country formed the most conspicuous portion of the work." The late Mr. Blore, who restored many "restored" Norman towers and Queen Anne mansions in England was called to the delicate task of undoing the restoration of 1762 on the Eleanor cross at Northampton about forty years ago. The monument is now in bad condition, owing to the ruin wrought by relic hunters and mischievous persons who throw stones at it and otherwise deface the cross and the four statues about it. Mr. Albert Hartshorne writes to the *Athenæum* to protest against another restoration of the kind that replaces battered ancient work by poor modern stone-cutting.

Persian Paintings. — The palaces of Ispahan are decorated with large oil paintings by the most eminent Persian artists of their day. All are life-size, and none are devoid of merit. Some are very clever, particularly the likenesses of Futteh Ali Shah and his sons, several of whom were strikingly like their father. As Futteh Ali Shah had an acknowledged family of seventy-two, this latter fact is curious. These paintings are without frames, spaces having been made in the walls to receive them. The Virgin Mary is frequently represented in these mural paintings; also a Mr. Strachey, a young diplomat who accompanied the English mission to Persia in the reign of our Queen Elizabeth, is still admired as a type of adolescent beauty. He is represented with auburn hair in the correct costume of the period, and copies of his portrait are still often painted on the pen-cases of amateurs. These pen-cases, or *kalamdans*, are the principal occupation of the miniature painter. As one-fourth of the male population of Persia can write, and as each man has one or more pen-cases, the artist finds a constant market for his wares in their adornment. The pen-case is a box of papier-maché eight inches long, an inch and a half broad, and the same deep. Some of them, painted by artists of renown, are of great value, £40 being a common price to pay for such a work of art by a rich amateur. Several fine specimens may be seen in the Persian Collection at the South Kensington Museum. It is possible to spend a year's hard work on the miniatures painted on a pen-case. These are very minute and beautiful. The writer possesses a pen-case painted during the lifetime of Futteh Ali Shah, a King of Persia who reigned long and well. All the faces — none more than a quarter of an inch in diameter — are likenesses; and the long black beard of the King reaching to his waist, is not exaggerated, for such beards are common in Persia. —*Chambers's Journal.*

Relation of Soil-Water to Cholera Epidemics. — That too much as well as too little water in the soil is unfavorable to cholera is vouched for by a large mass of facts. As I watched the cholera in Bavaria during 1854, I was surprised to find that the marshy districts, where, as a rule, the poorest dwelt, were exempt from epidemics. The great Donau bog, which lies between Neuburg and Ingolstadt, was surrounded by the epidemic, but the disease did not enter the villages on the fen. On the Freisinger moors an epidemic occurred at Halbergmoos. On going thither the affected houses were found to stand on a tongue of land composed of quartz, which tongue reached inward on the moor. Reinhard had proved the same thing for Saxony. The northern part of Saxony, which lies on the Spree, is a highly malarious district. For the eleventh time that cholera visited Saxony it shunned this region of fever. I will not say that cholera cannot be epidemic on a fen, but I do believe that when such an occurrence takes place we ought to ask ourselves what relation it may have with the state of moisture of the soil. The theory on the soil and subsoil water requires that a knowledge should be obtained of what takes place in and over the soil on the outbreak and on the cessation of cholera. It requires, as Port has said, a continuous record of facts. That cholera should very seldom be met with in the neighborhood of and on mountains is also in harmony with the disposition of cholera in respect of time; so that, as the frequency of cholera in these regions diminishes, the rainfall increases; the weather and cholera are equally capricious. Towns among mountains which are refuges for fugitives from cholera are but seldom situated on a soil which in and of itself would exclude cholera. Salzburg and Innsbrück have, for example, never yet been visited by cholera. Further, in 1866, these towns escaped, although a considerable influx took place from the seat of war where cholera raged. Salzburg, but still more Innsbrück, stands on the alluvial soil of the Salzbach and the Inn, as Munich stands on the Isar; but the first-named towns have about fifty per cent more rainfall than Munich. I can only imagine that the necessary degree of dryness for the development of cholera would be attained but very rarely in Salzburg and Innsbrück, just as occurred partially at Lyons in 1854, and in June, 1859, at Bombay, where cholera prevailed during the monsoons, which, as a rule, drive the cholera away. — *Dr. Max von Pettenkofer, in Popular Science Monthly.*

"Enlightened Selfishness," as illustrated in Unenlightened Building. — You have only to take the Cortlandt Street or Desbrosses Street ferry and cross to Jersey City in order to see how slight a motive to fire-proof building "enlightened selfishness" is. There is the Pennsylvania Railroad Company, whose offices and ferry-houses were burned down in the early part of August last, with a loss of some $200,000, rebuilding the same of wood. No part of the vast structure, which roofs in perhaps five acres of ground, is of brick or other fire-resisting material, except a building devoted to office uses, and there is wood enough in that to render the brick a mere shabby overcoat, or linen duster, as it were. The roof is tinned, and that is the only pretense that is made of a structural attempt in the direction of fire-proofing. The company is not a buyer of insurance, and, so far as the building itself, or the group of buildings, is concerned, the insurance companies can afford to regard the material thereof and the mode of putting it together with entire complacency. But not so as respects the jeopardy to neighboring structures, indeed, to a whole long line of warehouses and vessels, which and whose contents to the value of millions of dollars are insured. No doubt, as before, the railroad company will have the buildings thoroughly equipped with fire-extinguishing apparatus and a well-drilled force of men to use it. But in August last these did not avail to save the property from destruction. The fire then luckily happened on a still night and right after a succession of heavy rains. Had it been a time of drouth and half a gale of wind blowing, the limit of the fire's ravages would only have been reached with an exhaustion of material to burn. There is plenty of bad building along the Jersey City river front — in fact, we do not know of any good building there — and the Pennsylvania Railroad Company is only chargeable with its own contribution to the general stock of combustibles, but it was naturally to have been supposed that such a wealthy corporation would have found it wise to incur the additional expense requisite for making its new structures approximately fire-proof. Naturally, do we say? No, that was a mistake. All experience shows that it is not natural for either corporations or persons, however wealthy, to build so as not to burn. Corporations and persons get scared sometimes by the fire peril, and, as communities, combine to legislate how others shall build, but for themselves severally they will, whenever they can, dodge the law themselves helped to enact. "Enlightened self-interest," much as it is lauded by the philosophers, does not suffice as an inducement for the voluntary doing of what ought to be done in this matter of architecture. Nothing but legal compulsion will serve. Over in Jersey City there appears to be no building law of any account, or if there is one, nobody pays any attention to it. So it happens that a great corporation, wise enough to know better and rich enough to do better, has for three months past been heaping up a mass of kindling-wood to feed, if not to generate, the great conflagration, which, at some time in the not far-off future, is to sweep the front of Jersey City and bankrupt a dozen or more insurance companies. — *Insurance.*

Purifying Water by Air. — An interesting experiment on the purification of water by aëration is now going on at Philadelphia under the superintendence of Mr. Lutlow, chief engineer to the Water Department of that city. The plan is based on the discovery of Dr. Albert R. Leeds, to the effect that the action of air in purifying water is greatly increased by mixing the air and water under pressure. The greater the pressure the greater the absorption of oxygen, and consequently the greater the reduction of impurities. At Philadelphia, in order to make the experiment on a practical scale, a Fairmount turbine engine was converted into an air-pump which delivered 20 per cent by volume of free air into the water-main, this being the proportion found necessary by Dr. Leeds's experiments to surcharge the water. Analysis showed that the quantity of free oxygen in the aërated water was 17 per cent greater than before aëration, while the quantity of carbonic acid was 53 per cent greater, and that of the total dissolved gases was 16 per cent greater. The percentage of free ammonia was diminished to one-fifth of its former amount. The percentage of free oxygen represents the excess over and above what was required to effect the oxidation of the organic impurities. These results are very favorable, and point to the practical feasibility of reducing the percentage of organic matters contained in water unduly contaminated with sewage by this plan. —*Engineering.*

Prince Demidoff. — The Prince Paul Demidoff, whose name has become well known of late years, through the scattering of all the marvelous works of art that had been gathered at San Donato, near Florence, died lately in Paris. He was a man of enormous fortune, a principal owner of the malachite mines of Russia, and as great a roué as the Emperor Vitellius. Under the empire his escapades were the talk of Paris; he gambled for millions against one of his wealthy countrymen, and liked to be compared with Nero, for which purpose he made his servants dress like gladiators and fight before him. Then he married and a year afterward his wife died. Fearing that people might not think him sad enough, he resorted to all sorts of melodramatic tricks to show his grief, hung his wife's dresses about his room, and wandered about the streets in sordid garments. He sold his valuable collection simply out of caprice, and sold the old palace with them. Since then (1880) he has made another collection, which is housed in a villa at Pratoline, near Fiesole.—*N. Y. Commercial Advertiser.*

The By-Products of Charcoal-burning. — The vast quantity of smoke from 25 brick charcoal pits, producing 50 tons of charcoal per day, at Elk Rapids, Mich., is thus utilized: Large tubes over the pits, by means of a rotary suction fan, convey the smoke and gases to a great still of 2½ inch copper pipe, from which, after passing the purifier, runs a clear amber stream of pyroligneous acid. Each cord of wood contains 28,000 cubic feet of smoke (?) and, from 100 cords per 24 hours, there is produced 12,000 pounds acetate of lime, 200 gallons alcohol, and 25 pounds tar, beside the gas used under the boilers. Thus this product, from 40,000 cords of wood per annum, is a source of profit at little current expense. — *Springfield Republican.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

312,251. SASH-FASTENER. — Francis M. Case, Denver, Col.

312,262. DEVICE FOR RAISING AND LOWERING WINDOW-SASHES. — Henry Eitel and James E. Hunt, San Francisco, Cal.

312,266. ROD PLUMBING-LEVEL.—William Gurley, Troy, N. Y.

312,268. FASTENING FOR MEETING-RAILS OF SASHES.—James C. Hibbs, Brownsville, Mo.

312,269. ILLUMINATED TILE. — Eben N. Higley Great Falls, N. H.

312,276. AUTOMATIC ELEVATOR-GATE. — Robert Lade, Holyoke, Mass.

312,281. FILTER.—Jules Maille, Paris, France.

312,284. FIRE-PROOF PARTITION AND CEILING. — Charles Mettam, Bayonne, N. J.

312,290. WINDOW-GLASS. — James O. Pennychuck, New York, N. Y.

312,294. DOOR-HANGER. — Edward T. Prindle, Aurora, Ill.

312,300. COMBINED SHUTTER-WORKER AND SLAT-OPERATOR.—Thomas H. Smith, Auburn, N. Y.

312,305. BUILDING-BLOCK.—Solomon T. Trumbull, Gloucester, Mass.

312,315. SASH-HOLDER. — Fred Aurand and Freeman H. Sherer, Youngstown, Ohio.

312,349. CAST-IRON COLUMN. — P. Henry Griffin, Detroit, Mich.

312,350. COMBINED BORING AND REAMING TOOL. —William E. Hill, Kalamazoo, Mich.

312,356. ARTIFICIAL STONE.— John D. King, Fairbury, Neb.

312,357. CAR-DOOR FASTENING. — Jacob Pinzer, Pittsburgh, Pa.

312,374. DOOR OR WINDOW SCREEN. — Obadiah G. Newton, Trenton, Mo.

312,375. WALL OF BUILDINGS AND OTHER STRUCTURES.—W. H. Orr, Carlisle, Ind.

312,415. PORTABLE FIRE - ESCAPE. — Hermann Wettstein, Harvard, Ill.

312,419. ADJUSTABLE CLAMPING DEVICE. — Geo. W. Zeigler, Washington, D. C.

312,423. STEAM-HOIST. — Camille Bezançon, New York, N. Y.

312,426. DOOR-SECURER. — Edward A. Bullock, Du Bois, Pa.

312,433. GLUING-TABLE.— Jas. H. Clemons, Dolgeville, and Joseph W. Bower, Stratford, N. Y.

312,444. SHINGLE-PLANING MACHINE.—Thomas S. Disston, Philadelphia, Pa.

312,451. MANUFACTURE OF TARRED PAPER. — Michael Ehret, Jr., Philadelphia, Pa.

312,460. STAPLE. — Jonathan Haight, Pittsfield, Mass.

312,464. METHOD OF CONSTRUCTING HOLLOW BRICK WALLS.—Henry Harwood, Warren, O.

312,526. FLOOR-CLAMP. — Thomas A. Southwick, Brockton, Mass.

312,535. DRAWING - BOARD. — Frederick Weber, Philadelphia, Pa.

312,548. LEVEL.—John W. Atkinson, Benton, Ark.

312,549. FIRE-PROOF SHUTTER. — Charles F. Brigham, Boston, Mass.

312,553. CHIMNEY-COWL.—William E. Cooper, Dunkirk, N. Y.

312,575. DOOR-LATCH.— Thomas J. Morgan, Hyde Park, Ill.

312,582. PILE-DRIVER.— Jos. W. Putnam, New Orleans, La.

312,585. SKY-LIGHT. — John Seton and William Conolly, Brooklyn, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

DWELLING. — Jno. J. Weissner, Esq., is to have a three-st'y brick and stone dwell., 43' x 75', on Belair Ave., and to cost $12,000, from designs by Geo. A. Frederick, architect; Fred'k Decker, builder.

COTTAGE.—Geo. A. Frederick, architect, is preparing drawings for Philip Sinz, Esq., for a two-st'y frame cottage, 32' x 45', to be erected on the Harford Road, and to cost $3,000.

TOWER AND SPIRE. — Geo. A. Frederick, architect, is preparing plans for a tower and spire for St. James Church, cor. Eager and Aisquith Sts., 24' square, and 250' high, to be built of brick and Kentucky freestone, and to cost $30,000; J. M. Getz, carpenter.

OUT-BUILDINGS. — Miss Helen Whitridge is to have built brick and frame out-buildings, adjoining Druid Hill Park, to cost $5,000; from designs by Geo. A. Frederick, architect.

MARINE HOSPITAL.—Geo. A. Frederick, architect, is preparing plans for the United States Marine Hospital, to be built on Remington Ave., near Huntingdon Ave., which will be completed and forwarded to the Department at Washington, and advertisements for proposals published by the time of our next issue.

BUILDING PERMITS. — Since our last report seven permits have been granted, the more important of which are the following: —

J. C. Parker, 3 two-st'y brick buildings, n s alley, n of Lafayette Ave., and w of Mound St.

Sam'l Richmond, 2 two-st'y brick buildings, s s Hoffman St., rear s e cor. Hoffman and Harford Aves.

P. Reddington, 3 three-st'y brick buildings, w s Aisquith St., s of Hoffmann St.

Chesapeake M'f'g Co., one-st'y brick building 50' x 100', s s Federal St. bet. North St. and Falls Alley.

Brooklyn.

BUILDING PERMITS. — *Fulton St.*, n w cor. Bedford Ave., two-st'y brick store, tin roof; cost, $18,000; owner, Archibald Scott, 216 Adelphi St.; architect, A. Hill; builders, A. Rutan and Long & Barnes.

Varet St., n s, 58' e Graham Ave., 2 two and three st'y frame tenements (brick-filled), one with stable, tin roof; cost, $3,000; owner, Fred Luhrsen, 64 Graham Ave.; architect, H. Vollweiler.

Hull St., n s, 300' e Stone Ave., 2 three-st'y frame dwells., tin roofs; cost, $3,000; owner, J. Dornsife, Hull St., near Stone Ave.; architect, J. Rogers.

Madison St., n s, 200' e Patchen Ave., 5 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $3,000; owner and builder, Daniel Lauer, 1534 Fulton St.; architect, A. Hill.

Madison St., s s, 20' w Howard Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $3,700; owners, Gaynor & Mohler, 404 Park Ave.; architect, S. Harbison; builders, G. Straub and A. Schuman.

Thirty-ninth St., n s, 180' w Fourth Ave., three-st'y brick dwell., tin roof, wooden cornice; cost, about $3,500; owner, Ann Abraham, 139 Thirty-ninth St.; builder, J. J. Abraham.

Reid Ave., n w cor. Pulaski St., three-st'y brick store and flat, tin roof; cost, $7,800; owner, L. Bredehoft, Broadway, cor. Lawton St.; architect, F. Holmberg; builders, E. Loerch and J. Rueger.

Boerum St., n s, 125' w Bushwick Ave., four-st'y frame tenement, tin roof; cost, $6,000; owner, Mrs. S. Diercks, Boerum St.; architect, Th. Engelhardt.

Stagg St., *No.* 223, n s, 175' w Bushwick Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner, Rudolph Brand, on premises; architect, Th. Engelhardt.

Duryea St., s s, 225' e Broadway, two-st'y frame (brick-filled) dwell., tin roof; cost, $4,000; owner, Claude Lorrane, 1157 Broadway; architect, Th. Engelhardt.

Middleton St., s s, 105' e Marcy Ave., 5 three-st'y frame (brick-filled) dwells., tin roofs; cost, each, $4,500; owner, F. Mosetter, 122-126 Harrison Ave.; architect, Th. Engelhardt.

Gwinnett St., n s, 85' e Marcy Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,800; owner, etc., the same as last.

Middleton St., n s, 140' w Harrison Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $5,000; owner, etc., same as last.

Elm St., n s, 265' w Evergreen Ave., three-st'y brick tenement, tin roof; cost, $4,000; owner and builder, John Hagan, 69 Elm St.; architect, John Herr.

Scholes St., *No.* 103, n s, 155' w Ewen St., three-st'y frame store and tenement (brick-filled), tin roof; cost, $3,000; owner, Louis Goetting, 105 Scholes St.; architect, Th. Engelhardt.

Quincy St., s s, about 200' e Reid Ave., 5 two-st'y brown-stone dwells., tin roofs, wooden cornices; cost, each, $5,000; owner and builder, P. Concannon, Summer Ave. and Van Buren St.; architect, J. D. Reynolds.

Twelfth St., n s, 155' 4" e Seventh Ave., 3 three st'y brick dwells., tin roofs; cost, each, $4,000; owner, J. Brown, 381 Eleventh St.; architect, J. D. Reynolds; builder, W. Brown.

Gwinnett St., n s, 184' e Harrison Ave., 2 three-st'y frame (brick-filled) tenements, and 254' e of Harrison Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,500; owner and builder, Jacob Bossert, 233 Lynch St.; architect, Jno. Platte.

Gwinnett St., n s, 234' e Harrison Ave., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,290; owner and builder, Jacob Bossert; architect, Jno. Platte.

Buffalo.

Mr. R. A. Bethune, architect, has in hand the following buildings: —

FACTORY. — Factory-building on Lake View Ave., for H. T. Koerner: cost, $22,000.

HOUSES. — *Summer St.*, house, for Spencer Kellogg; cost, $15,000.

Prospect Ave., semi-detached house, for E. Webster & Son; cost, $18,000.

Prospect St., semi-detached stable, for E. Webster & Son; cost, $5,000.

Main St., house for A. A. Hickman; cost, $5,000.

Dearborn St., house, for Dr. J. H. Potter; cost, $4,000.

Hodge Ave., house, for Mrs. E. Baldauf; cost, $4,500.

Prospect Ave., house, for G. N. Mitchell; cost, $3,500.

Hodge Ave., house, for Mrs. John Pierce; cost, $3,500.

Ashland Ave., house, for Mrs. Davidson; cost, $2,500.

Elmwood Ave., house, for Geo. L. Thorn; cost, $3,500.

SCHOOL-HOUSES.—Public School No. 8; cost, $50,000.
Public School No. 18; cost, $30,000.
Public School No. 24; cost, $10,000.
Police Station No. 11; cost, $15,000.

Chicago.

HOUSES. — P. W. Ruehl, architect, planned the two-st'y dwell., to be built on Ashland Ave. for A. Blettner, Anderson pressed brick, red sandstone trimmings.

Same architect has completed drawings for two-st'y stone front house on Harrison St., for M. Chanski.

STORE.—P. W. Ruehl, architect, planned the stone-front store-building on West Twelfth St., for J. J. Phelan.

BUILDING PERMITS. — Thomas Brown, 2 two-st'y flats, 3221-23 Calumet Ave.; cost, $8,000; architect, J. H. Huber; builder, N. Hoeft.

Dale & Hart, six-st'y factory, 43-45 Fourth Ave.; cost, $45,000; architect, J. M. Van Osdel & Co.; builder, J. Linguist.

New York.

BREWERY.— A five-st'y and basement brick brewery, 25' 9" x 87', is to be built on the e s of Ave. A, between Fifty-sixth and Fifty-seventh Sts., at a cost of about $20,000, from designs of Mr. A. Pfund.

HOTEL. — On the s w cor. of Forty-second St. and Fourth Ave., a four-st'y hotel, from designs of Mr. Wm. Kuhles.

INSURANCE BUILDING. — The N. Y. Equitable Life Insurance Company, of 118 to 124 Broadway, have appointed Mr. Geo. B. Post architect for the proposed extension to their building.

APARTMENT-HOUSES. — Sixteen five-st'y brown-stone flats, 25' x 67', are to be erected at a cost of $300,000, for Messrs. Moore & McLaughlin, from plans of Messrs. Thorn & Wilson.

At One Hundred and Twenty-fifth Ave., Ninth Ave. and Manhattan St., an apartment-house is to be built for Mr. Jared W. Bell, from plans of Thayer & Robinson.

BUILDING PERMITS. — *Fulton Ave.*, e s, 201' s One Hundred and Sixty-eighth St., three-st'y frame tenement, tin roof; cost, $8,000; owner, Mrs. Sarah J. Miller, 2155 Second Ave.; architects, Ebeling & Heinicke.

West Seventeenth St., *Nos.* 142 *to* 152, 6 five-st'y brick tenements and stores, tin roofs; cost, total, $120,000; owner, Rudolph Bohm, 270 Grand St.; architect, Wm. Graul; builder, John Goerlitz.

Seventy-first St., s s, 213' e First Ave., five-st'y brick tenement, tin roof; cost, $16,000; owners, Julius Landauer, 337 East Fiftieth St., and Maurice Kaim, 238 East Forty-eighth St.; architect, F. S. Barus.

One Hundred and Seventh St., s s, commencing cor. Fourth Ave., running east, 9 four-st'y Connecticut brown-stone tenements, tin roofs; cost, each, $12,000; owner, Wm. F. McEntee, 224 East One Hundred and Fifth St.; architect, F. T. Camp.

West Thirty-first St., *Nos.* 209 *and* 311, 2 five-st'y brick tenements, tin roofs; cost, each, $15,000; owner, Geo. W. Bond, 584 Lexington Ave.; architect, M. C. Merritt

Columbia St., *No.* 28, five-st'y brick tenement, tin roof; cost, $15,000; owner, B. Rosenstock, 191 First Ave.; architect, E. W. Greis.

Willett St., *Nos.* 89 *and* 91, 2 five-st'y brick tenements and stores, tin roofs; cost, each, $15,000; owner, Thomas Rothmann, 21 Clinton St.; architect, Julius Boekel.

West Sixteenth St., *Nos.* 226 *and* 228, 2 five-st'y brown-stone front tenements, tin roofs; cost, each, $18,000; owners, McAuliffe & Gabay; architects, A. B. Ogden & Son.

Forty-second St., s s, 155' w Second Ave., two-st'y brick stable, gravel roof; cost, $5,000; owners, Jos. and Robert Gordon, Second Ave. and Thirty-ninth St.; architect, Albert Wagner.

Fifty-first St., s s, 75' w Fourth Ave., 3 five-st'y brick flats, tin roofs; cost, each, $28,000; owners and builders, P. & J. F. McManus, 161 East Fifty-seventh St.; architect, J. H. Valentine.

Fourth Ave., n e cor. Eighty-seventh St., five-st'y brick tenement and store, tin roof; cost, $22,000; owners and builders, Clark & Nason, 305 East Eighty-first St.; architect, G. A. Schellenger.

Fourth Ave., e s, 25' 8" n Eighty-seventh St., 3 five-st'y brick tenements, tin roofs; cost, each, $20,000; owners and builders, Clark & Nason, 305 East Eighty-first St.; architect, G. A. Schellenger.

Essex St., *No.* 39, six-st'y brick tenement and store, tin roof; cost, $22,000; owner, Bertha Solomon, 2 Baxter St.; architect, Wm. Graul.

Seventy-eighth St., n s, 100' e Second Ave., five-st'y brick tenement, tin roof; cost, $15,000; owner, Edward Ward, 228 East Fifth St.; architect, J. Kastner.

Robbins Ave., n w cor. One Hundred and Forty-ninth St., three-st'y frame dwell., tin roof; cost, $5,000; owner, Wm. Miller, on premises; architect, A. Arctander.

Vanderbilt Ave., e s, 150' n One Hundred and Seventy-first St., 3 two-st'y frame dwells., tin roofs; cost, each, $2,000; owner, Susan M. Jones, Huntington, N. Y.; architect and builder, John Knox.

ALTERATIONS.— *Pearl St.*, *No.* 480, six-st'y brick extension on side, tin roof; cost, $10,000; owner and architect, Thos. R. Jackson, 61 Broadway.

Kingsbridge Road, near One Hundred and Seventy-fifth St., repair damage by fire; cost, $4,500; owner, Isaac P. Martin, Ft. Washington; builder, Elward Smith.

Third Ave., s w cor. One Hundred and Fifty-fourth St., raise three stories, new store front, iron posts and columns; cost, $3,000; owner, Pauline D. Walker, 8 West Thirty-sixth St.

East Broadway, *No.* 65, front and interior alterations; cost, $3,500; owner, Bertha Solomon, 2 Baxter St.; architect, W. Graul.

Attorney St., *No.* 28, three-st'y brick extension to pastor's residence, tin roof; also remove gallery in church and put in large window, etc.; cost, $8,000; owner, Church of St. Mary, Rev. Nicholas Hughes, pastor, 28 Attorney St.; architect, L. J. O'Connor.

West Forty-sixth St., *No.* 466, five-st'y brick extension, tin roof; cost, $6,000; owner, John Ritter, 115 Greenwich Ave.; architect, Wm. Graul.

East Eighth St., *No.* 135, repair damage by fire, and a one-st'y brick extension on front; cost, $3,400; owner, Lydia Fox, 3 East Fifty-fourth St.; builder, P. Roberts.

Philadelphia.

BUILDING PERMITS. — *Green Lane*, bet. Mitchell St. and Ridge Ave., two-st'y brick building, 14' x 34'; Howard Tocunh, contractor.

Cumberland St., bet. Amber and Coral Sts., one-st'y boiler and engine-house, 14' x 38'; Wm. C. Haddock, contractor.

St. Louis.

BUILDING PERMITS. — Seventeen permits have been issued since our last report, three of which are for

unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —

Ernst Neuer, frame dwell.; cost, $6,000.

Merchants' Elevator Co., frame elevator; cost, $85,000; Wm. E. Bent, contractor.

Third Baptist Congregational Church, one-and-two-st'y brick church; cost, $41,000; I. S. Taylor, architect; Henry E. Roach, contractor.

Anheuser Busch Brew. Co., one-st'y brick blacksmith shop; cost, $3,500; E. Jungenfeld, architect; sub-let.

W. H. Simpkin, two-st'y brick dwell.; cost, $3,600; B. W. Proetz, contractor.

G. H. Shriner, one-st'y double tenement; cost, $2,500.

F. C. Bonsack, two-st'y brick carpenter-shop; cost, $3,500; F. C. Bonsack, contractor.

J. M. Green, three-st'y stores and offices; cost, $3,000; sub-let.

Henry Minges, two-st'y brick dwell.; cost, $3,000; A. Beinke & Co., architects; Phil Riechers, contractor.

J. A. Fanning, 2 adjacent two-st'y dwells.; cost, $5,000; sub-let.

J. P. Fairley, 7 adjacent two-st'y dwells.; cost, $20,000; sub-let.

St. Paul, Minn.

BUILDING PERMITS.— To be built on the cor. of Nina and Laurel Ave., 2 double houses; cost, $20,000 each, Mr. C. Riley.

House for C. Riley; cost, $6,000; A. M. Radcliff, architect.

Minnesota Club-House, cor. of Fourth and Cedar Sts.; cost, $30,000; Chas. T. Mould, architect.

Two-st'y frame double dwell. on Burr St.; cost, $4,800; owner, G. W. Dieter.

Two-st'y frame double dwell. on Burr St.; cost, $4,800; W. A. Miller, owner.

Two-st'y frame double dwell., s s of Grove St.; cost, $6,000; owner, Mrs. C. A. Finchout.

One-st'y roller rink, East Seventh St.; cost, $2,500; owner, Mr. Geo. Leonard.

General Notes.

CARTHAGE, N. Y. — Frame dwell.; cost, $4,000; C. P. Ryther, owner; Johnston & Buell, architects, of Ogdensburg, N. Y.

CORNWALL, ONT. — Four brick stores and offices; cost, $19,000; J. G. Snetzinger, owner; Johnston & Buell, architects, of Ogdensburg, N. Y.

DUNKIRK, N. Y. — House for H. G. Brooks, of the Brooks Locomotive Works; cost, $35,000; R. A. Bethune, architect.

FERGUS FALLS, MINN. — An armory association is about to be formed in the city by Company F, with a capital stock of $10,000. The object of the plan is that the company can purchase suitable grounds and erect an armory for their exclusive use.

IROQUOIS, ONT. — Stone dwell.; cost, $20,000; M. F. Beach, owner; Johnston & Buell, architects, of Ogdensburg, N. Y.

KANSAS CITY, MO.—D. C. Strawbridge, a $5,500 brick block for residences, at 900, 902, 904 and 906 Tracy Ave.

John A. Patton, three $900 frame residences, at 549, 551 and 553 Lydia Ave., and two $700 frame residences at 555 and and 557 Lydia Ave.

J. E. Raber, $3,500 brick residence at 1514 McGee St.

Mr. G. Nelson intends building a five-st'y brick building at the s e cor. of Missouri Ave. and Main St.

MARSHFIELD, MASS. — By the provisions of the will of the late Seth Ventress of Marshfield, $10,000 has been given to Luther Hatch, in trust, to be used in building an edifice to be known as the Ventress Memorial Hall. The town is to have the use of the same for a public library and other town purposes.

NEWTON, MASS. — Plans have been adopted by the Building Committee of the Newton Baptist Church, and a contract made with Mr. Norcross for the erection on Church St., Ward 1, of a stone church, to cost, with the land about it, about $70,000. The architect is to be Mr. H. H. Richardson of Brookline, and the style of the structure is to be Romanesque. The audience-room will accommodate 650 persons, and the arrangements are to be of a new and excellent nature.

NORWOOD, N. Y.—Brick school; cost, $12,500; School Board, owner; Johnston & Buell, architects, of Ogdensburg, N. Y.

PLEASANT PLAINS, STATEN ISLAND, N. Y.— Ground is about to be broken for a new parsonage for Father Drumgoold and for a new building for the sisters in charge of the Mount Lorette Mission. Both buildings will be near the Mission.

PRESCOTT, ONT. — Stone dwell.; cost, $5,000; S. S. Smades, owner; Johnston & Buell, architects, of Ogdensburg, N. Y.

RENFREW, ONT. — Stone dwell.; cost, $15,000; A. A. Wright, owner; Johnston & Buell, architects, of Ogdensburg, N. Y.

ROCHESTER, N. Y.—A company has been formed here for the purpose of building and conducting a crematorium. Its members are James H. Kelly, Frank S. Upton, Matt Cartwright, Hamlet S. Briggs, A. W. Mudge and Rowland Milliman. The capital stock is $10,000. The building will be erected immediately on a plot of ground near Mt. Hope Cemetery, to be leased from the city.



THE CHIMNEY-PIECE IN THE COUNCIL-HALL OF THE PALAIS DE JUSTICE,
BRUGES, BELGIUM.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS.

IT has been suggested to us that many persons might hesitate to act on the suggestion we offered a fortnight ago, and might refrain from expressing their opinion as to the ten buildings in this country that can claim the highest architectural rank, because we requested them to sign their votes. We beg to assure them that our only object in asking for a signature is to prevent a breach in that most valuable editorial rule, which requires a signature as an "evidence of good faith." Another feeling may act to prevent the full expression of opinion we desire to secure, and that is the feeling that though most architects have to move about through considerable areas of the country in the prosecution of their business, and so have become familiar with many buildings, they can never feel sure that those they have not seen may not be better than the ones they have seen. This is of little importance, for we hope to receive a sufficient number of replies to be able to make a sub-classification of the votes by cities, or at least by contiguous sections. We must ask our reader's indulgence if in seeking to draw out a full vote, we adopt in this issue a somewhat vulgar means of attracting their attention by typographical trickery.

WE have received a copy of the text of the revised Building Act now under consideration in the Massachusetts Legislature, and although we dislike, as a rule, to comment upon matters pending before the proper authority, we cannot refrain from expressing our sincere hope that the Act may pass without modification, and our opinion that in this case the people of Massachusetts will have reason to congratulate themselves on the possession of a building code superior to any in force in the world. This seems a good deal to say, when one considers the elaborate and excellent provisions of the Parisian and Viennese codes; but we think that most experts will agree with us, that the proposed Massachusetts law, while perfectly adapted to our usual methods of building with light wooden frames, evinces a skill and a familiarity with modern methods, in providing for the protection against fire by the simplest and cheapest means, of these as well as other forms of construction, which no other building code can show. This is high praise, but it is deserved, and every citizen of Massachusetts who is interested in questions of public safety or health, as affected by the proper construction of buildings, should avail himself of all suitable opportunities to promote the passage of the Act.

THE Annual Report of the Boston Manufacturers' Mutual Fire Insurance Company, with that of the Spinners' Mutual Company, contains, as usual, much interesting and valuable information. Apart from the details of the causes of fires in the insured mills, and the methods by which they were extinguished, which form the portion more particularly interesting to architects and builders, there is something well worth notice in the statement of the financial condition of the companies. Taking the Boston Company, which is much the larger of the two, as an example, we find that it now holds risks on more than seventy-three million dollars' worth of property. On this it collects premiums at the average rate of eighty cents for each hundred dollars insured, and at the end of the year returns in the form of dividends the surplus left over after paying for the losses out of the premiums received. Although the mills insured by the Company are regarded as hazardous risks, so admirable is the system under which, by the suggestions of the officers of the Company, they are protected against fire, that for the last seven years the average sum paid back to members has been very nearly three-quarters of the premiums received; making the actual cost of insurance about twenty cents on each hundred dollars' worth of property covered; or, to put the same facts in a different way, if the Mutual Company had been managed like a stock company, and had kept all the premiums paid, at the low rate of eight-tenths of one per cent, instead of returning the greater part of them in dividends, the accumulation of the surplus of premiums over losses in the last seven years would now be sufficient, if invested as capital at five per cent interest, to keep the same property perpetually insured, at the present average rate of losses, without the payment of any more premiums.

THIS remarkable result, which shows that, with adequate precautions, cotton and woolen mills, filled with inflammable material, with chemicals liable to spontaneous combustion, and with machinery in rapid motion, can be insured at about the same rate as brick dwelling-houses in city streets, is by no means the consequence of unusual good fortune. On the contrary, the record of the past year shows that forty-eight fires have occurred in the insured mills, and the smallness of the aggregate loss has evidently been due to the precautions insisted upon by the Company, which have reduced the damage in the vast majority of cases to amounts less than a thous nd dollars, and in many to such trifling sums as eight or ten dollars, the larger losses being very exceptional. Risks are now taken to the amount of two hundred thousand dollars on a single building, and within the present year two fires have already occurred, each of which involved a lo-s of more than one hundred thousand dollars; but the persevering application of well-understood rules, has reduced the average rate of loss to a mere trifle. Among the most curious fires mentioned was one occasioned by a rocket, which descended into the dust flue from a picker, and, lighting the dust, set fire to the contents of the picker-room, fortunately without doing much damage. Another which caused great destruction was transmitted with extraordinary celerity from some oily stock burning in one building to the adjoining one, through a covered bridge, setting the second building on fire from end to end, and totally destroying it, although it was completely furnished with automatic sprinklers. It is supposed in this case that the steam from a pipe which broke at that moment served to convey the gas from the burning stock into the second mill, perhaps mixing with it to form a very explosive compound.

THE New York Fire Commissioners had an opportunity the other day of testing practically the effect of bringing electric-light wires in contact with telephone wires, which will probably serve to quicken their apprehension of the dangers to be anticipated from such occurrences in a manner very advantageous to the people whom they are appointed to guard. According to the New York *Evening Post*, the superintendent of the fire-alarm telegraph was in the office of the President of the Fire Commissioners when the telephone bell rang. He went to the instrument and applied the receiver to his ear, but instantly dropped it with a cry, and sank into a chair with his hand to his head, while a puff of smoke issued from the telephone. Almost at the same instant a cry of fire was heard on the stairs, and the President of the Commissioners ran to sound a signal which called the nearest engine to the spot. A moment later the firemen entered, with axes and hose, and, making their way to the telegraph-office in the upper story, found the furniture and apparatus in confusion, but the fire, for which they had been called, already out. It seems that the high wind which prevailed during the day had blown some electric-light wire upon the telegraph lines, and the effect of the strong current was immediately seen in the puff of smoke which issued simultaneously from stands of wires in different parts of the room, from the burning off of the insulating coverings of the

wires affected. A few minutes after, however, a dense smoke was seen rising from behind one of the large wooden stands, and on pulling away the front of the woodwork, flames burst out, which reached nearly to the ceiling. This caused a panic in the room and the cry of fire was raised. Fortunately, pails of water and wet cloths sufficed to extinguish the conflagration, and the principal damage done consisted in the destruction of three of the fire-alarm circuits, and the consequent isolation of the districts which they served from the protective system. The Superintendent recovered gradually from his shock, and, beyond a severe headache and hands badly burned, suffered no material injury.

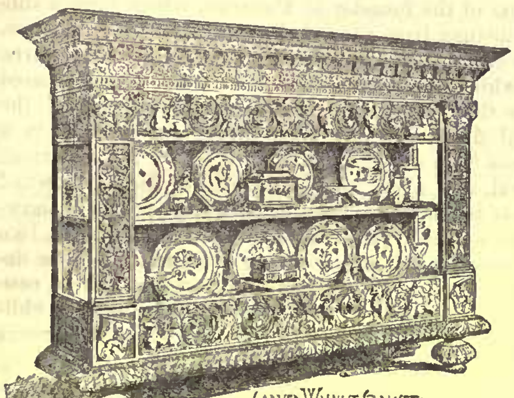
THE Wakefield Home Fire Protective Association, of which we made some mention in our last issue, has begun a series of inexpensive but interesting experiments with different appliances for controlling fires. The first experiment, which took place some weeks ago, was intended to determine the rate of combustion of different materials, such as "excelsior," or thin wood shavings, straw, cord wood, leaves, and other substances of the same sort. Among these materials it was found that excelsior, which is practically the same thing as the slivers which cover the surface of laths and rough timber, and line the hidden spaces of frame houses with an inflammable fur, was perhaps the most combustible. Although, bulk for bulk, it burns no more rapidly than straw, its combustion is much fiercer and the fire more intense. Leaves, as might be expected, are not very inflammable, and burn rather slowly, and the combustion of cord-wood varies in rapidity in a manner pretty well known. The next experiment of which we have noticed the report was a trial intended to test the common theory that a fire of kerosene or petroleum cannot be extinguished with water. This, we may say, is a comparatively recent notion, and is perhaps a reaction from the earlier one, that water would put out all fires whatsoever, on the faith of which a certain Philadelphia fire engineer turned a hose into an underground tank of petroleum, that had taken fire at the manhole, and kept the stream running into it until the fire went out, which happened when all the oil in the tank had been replaced by water. However that may be, experience has shown that water is a poor weapon for defence against burning oil, and the Wakefield experiments were made to ascertain just how much, if any, effect water would have under such circumstances. For this purpose a barrel of shavings was prepared, and two members of the Association stationed near, one armed with a hand-pump and a pail of water, and the other with a similar pump and a pail of kerosene oil. The shavings were then lighted, and water and oil thrown simultaneously on the fire. At every trial the double stream, of equal parts of water and oil, extinguished the fire in less than half a minute. To those who have seen the terrible combustion produced by throwing a jet of petroleum alone upon a fire, this result will seem surprising, but so confident are the members of the Association of the effect of applying liquids promptly, that further experiments are to be made, it is said, with oil alone, or with a very small portion of water. As a corollary to these experiments, we will suggest that others be tried, to show the effect of ammonia in putting out petroleum fires, as well as those of other materials. It is now established that ammonia is by far the most effective means of controlling fires in naphtha and oil refineries, and it may prove to have value in other cases.

LAST June a convention of the heads of the various departments or commissions of labor-statistics in the United States was held at St. Louis, and, apparently as a professional exercise, the members of the convention determined to visit the famous city of Pullman, Illinois, and see for themselves what was intended there, and how far the ends proposed had been attained. For this purpose a special meeting of the convention was ordered at Pullman, in September, and at the specified time thirteen gentlemen, perhaps as well qualified to act as judges in such matters as any thirteen persons in the world, met there to see how the people of Pullman fared in comparison with those of similar professions in other places. The report which they prepared for publication, after their investigations were concluded, has been very kindly sent to us, and although we could wish that its tone were a little less laudatory, it must be acknowledged that the statistics which they obtained in regard to the life of the place justify praises which it would be hard to keep from seeming a little extravagant.

LEAVING out of account the intelligence, or benevolence, or other merits of the founder of Pullman, which form a subject quite distinct from that of the success of his enterprise, we are told by the Labor Commissioners that in the last three years, during which the population of Pullman has increased from about one thousand to more than eighty-five hundred, the average annual death-rate has been seven and one-half in a thousand, or less than one-third the average rate for American cities in general, and about one-half that of places renowned as the healthiest in the world. Of course, this favorable showing is partly due to the fact that the inhabitants of Pullman, like those of all new towns, are mostly young or middle-aged, the decrepit or helpless having little reason for taking up their residence there; but, on the other hand, there are many little children in the town, more than half the deaths being of persons under five years of age; and, the industries of the place being almost entirely connected with railway management, and with a rather dangerous class of manufactures, there are many casualties among the adult inhabitants, the number of deaths from violence in 1883 having been seventeen, or nearly as many as those from all other causes combined except infantile diseases. This is certainly an extraordinary showing, and the means by which such healthfulness is secured for a population of no very exceptional character are worthy of earnest study. First among them is undoubtedly the excellent system of drainage. We need not dwell upon this, which has been often described; it is enough to say that the separate system of sewerage has been carried out in the town with great thoroughness and skill, the surface water being conveyed through large brick sewers directly to Lake Calumet, while house drainage is taken through glazed pipes to a subterranean reservoir, from which it is pumped upon the famous sewage farm. It is worth noting that the sewage delivered at the farm amounts to about one hundred gallons daily for each inhabitant, showing a very free use of water in the houses of the town. The area of the tract upon which the sewage is now utilized amounts to about one hundred and forty acres, the intention being to provide at least one acre for each one hundred of the population. Pipes are laid beneath the surface for distributing the sewage, which is strained of all particles more than half an inch in diameter by a screen at the reservoir; and the application of the liquid to the ground is made by means of hose, which can be attached at pleasure to hydrants placed at convenient intervals. The whole tract is underdrained with tiles in the usual manner, and the effluent water, which is found to be perfectly clear and wholesome, is conveyed to Lake Calumet. It is hardly necessary to point out the difference between this admirable system and the ordinary engineer's irrigation-farm, in which the unfortunate crops are drenched with sewage at all times, favorable or unfavorable, instead of being fed with it, as is done by means of the hydrant and hose, only when they need it; and persons interested in the subject will be likely to reflect that the wonderful financial success of the farm is undoubtedly due mainly to the adoption of this rational and scientific plan.

THE social and moral health of the Pullman community seems from the Commissioners' report to be looked after with as much care and success as its physical welfare. Among the methods by which habits of neatness and decency are inculcated, the most efficient is perhaps to be found in the tasteful laying-out of the streets, and the interesting variety and careful planning of the houses. If there is anything in Mr. William Morris's idea, that the life of factory operatives can never be made tolerable until they are provided with something to satisfy the sense of beauty innate in every human being, the mere attractiveness of the broad and sunny streets, bordered with trees and diversified with small parks, on which the picturesque little houses front, should prove very grateful to people accustomed only to the alleys lined with hideous barracks in which they are compelled to live in most cities; but the convenient arrangement of every dwelling, down to the humblest tenement, by which water is supplied in unlimited quantities in the rooms, and all garbage and sewage are removed by the public care, probably does still more to habituate the occupants to cleanliness and external purity; while the system of leasing under which every tenant's rent is deducted from his wages, although distasteful to those who insist upon what they call liberty in paying their bills, serves to inculcate principles of punctuality in money affairs which cannot fail to be useful.

DECORATIVE TILES.[1] — II.


CARVED WALNUT CABINET. XVI CENTURY. FROM LAST.

DURING periods when men voluntarily deface, destroy and seek to hide from view all that is beautiful and pleasing in art, it is not to be expected that there would be produced anything in the shape of decorative tiles. The history of the revival in this line of manufacture commences in England with about the latter half of the present century. Mr. F. J. Wyatt's patent for imitating tesselated pavements with colored cement proved unsatisfactory, from unequal wearing, early in the century.

The experiments of Mr. Blashfield in this line with bitumen, colored with metallic oxides, also proved at first unsatisfactory; but he finally succeeded in some undertakings, and constructed an extensive and elaborate inlaid pavement on the plan of the Venetian *pisé* floors, after the designs of Mr. H. S. Hope, which is still, or was up to a few years ago, in a good state of preservation at the country-seat of the designer.

An important step towards the revival of the art was the mode of Mr. Singer of Vauxall, for forming tesseræ by the cutting out of thin layers pieces of the required form, which were afterwards dried and baked in the usual way. This patent also improved the method of uniting the tesseræ with cement, so as to form a slab of convenient size for paving, and some admirable mosaics were executed by him in this way.

In 1840, Mr. Prosser, of Birmingham, discovered that if the material of porcelain (a mixture of flint and fine clay) be reduced to a dry powder, and in that state be subjected to strong pressure between steel dies, the powder is compressed into about one-half its bulk, and is converted into a compact, solid substance, of extraordinary hardness and density, much less porous and much harder than the common porcelain, uncompressed and baked in the furnace. The applicability of this ingenious process to the manufacture of tesseræ for pavements soon afterwards occurred to Mr. Blashfield, who made arrangements with Messrs. Minton & Co. (the manufacturers appointed to work Mr. Prosser's patent) for a supply of small cubes made according to the new process; these he submitted to various trials and experiments, and having found them in every respect suitable for the purpose, he, in conjunction with Messrs. Wyatt, Parker & Co., carried out the invention on an extensive scale. Tesseræ of various colors and forms — red, blue, yellow, white, brown; quadrilateral, triangular, rhomboidal, hexagonal, etc., have been manufactured on this principle in large numbers. Pavements of considerable strength have been constructed with them, and they have been found to possess the following advantages: First, being formed in similar steel dies, they are of uniform size and shape, so that they can be fitted together accurately, in the execution of the most complicated designs. Secondly, being all composed of the same material variously colored, they are all about of an equal hardness, so that pavements made with them are not liable to wear into hollows by use. Lastly, owing to the effect of the intense pressure under which they are made, they are quite impervious to moisture, of a flinty texture throughout, and, in a word, to all intents and purposes imperishable, except through sheer wantonness.

Another and later method than that invented by Mr. Prosser, that of using dust-clay, is known as the "Boulton and Worthington process," and is used by Malkin & Co. It consists in the use of metallic boxes, fitted with plungers, and fashioned like the arabesques or other patterns, to be used as ornaments, in which the "design-clay" dusts are compressed within a frame, which frame is afterward — the boxes and plungers being first removed — filled with clay-dust of the ground color, which is compressed within the frame and around the pattern made as stated, and the whole then fired.

The great perfection to which this important branch of pottery has arrived in so short a period of time is largely due to the great energy and practical intelligence of Mr. Herbert Minton, in England; and the firm of Minton & Co. is so well known in connection with it that there is no necessity for enlarging upon their achievements.

The very rapid progress that has been made in this refining art in England is an accomplishment of which all English-speaking people are justly proud. The hand-painted "art-tiles," richly-glazed enamelled tiles, and embossed and glazed majolica tiles produced in England are marvels of beauty, considering the short time since the revival of the art of their production.

As we have stated, the tiles which have been named are very beautiful, and it hardly seems just to compare the present production of tiles in England with another branch of the ceramic art, and with a people who have fostered a national passion for the production of beautiful porcelain and enamel ware for more than a thousand years. But the subjects of hand-painted "art tiles," and glazed enamelled tiles of all kinds, are so closely allied to the glazed and enamelled productions of the whole world, that there is an almost irresistible impulse to compare and examine the designs and enamels of old and new Japanese productions, and then we are sadly impressed with the fact that, with all our boasted culture, refinement, morality and higher civilization, we are immeasurably their inferiors in this cherished branch of knowledge. The artists of Japan are more truthful, sympathetic and faithful in their delineations of birds, foliage and flowers than we are; they seem to discover, as if by instinct, the salient points of natural objects, and to portray them in form so true, in feeling so soft and appealing, yet in manner of treating so strong and striking in all their details, that we pause, admire, wonder; but to imitate seems impossible. "They confine themselves to no particular object; no one subject receives more care or consideration than another. From the highly cultivated, magnificent flower of gigantic proportions, to the humble, shrinking, modest daisy hiding away in the high grass, as well as from the strong, sturdy fir tree to the dwarf oak, that can hardly be seen, from the imaginative *Ho-ho* down to the most insignificant inhabitant of the feathery kingdom in their sunny island home, all are impartially treated." As we stand in the Kensington Museum and gaze upon the specimens of Hizen ware, Satsuma *faïencée*, Ise, Kaga, Kioto, Owari, and other most beautiful productions of a country abounding in glorious artists, there is pure admiration, unabased by any lower feelings. As a people the Japanese are much closer observers than any other nation. In their holidays they gather from the woods and from the fields natural objects, carry them to their city homes, preserve them as long as possible in all their beauty, and when they perish, reproduce them in artificial representatives.

But this branch of pottery cannot be further enlarged upon in the present paper, and the expressions of admiration were betrayed even as my eyes, at the instant when these words were first penned, feasted upon some beautiful specimens of the wares which have been named.

Having devoted so much space to a description of the development of the art of decorative-tile making in Europe, it is now proper that we should speak of what has been accomplished in our own country. The largest manufactory in this country for the production of encaustic paving tiles is that of the United States Encaustic Tile Company, of Indianapolis, Ind. Their productions are good and are mostly vestibule and paving tiles. The most prominent productions of decorative tiles are those from Chelsea, near Boston, Mass. The good execution of designs in these tiles is fast making them very popular, and there is no doubt but that the works at Chelsea are only the advance guard of numerous productive industries of this country, which are destined soon to lead those of Europe.

Sending tiles to Staffordshire may seem to the majority of Englishmen a wild improbability, but ere long that fact will be accomplished. One thing which greatly aids us is the tendency of English manufacturers in this line to lower the high standard of their wares and produce something cheap; a course which is a great error. Indeed this policy of sacrificing everything, including the actual producers themselves, to cheapness, too entirely dominates the English mind, with results which have been harshly but properly characterized as "cheap and nasty," and which also causes the brutalization of humanity. All true art demands high standards, which must be rigidly adhered to: seek to elevate them you may, without harm, but to do aught to lower them is but to take a step on the road to their destruction.

Much credit is due in the production of decorative tiles to the efforts of Mr. J. G. Low, of Chelsea, Mass. The art-tiles manufactured in this country had hitherto been poor, both in design and execution, until Mr. Low turned his attention to imparting to plastic clay a new character of artistically finished and pleasing delineations of animate forms, flowers, and conventional ornaments. America possessed nothing in this line of production that was a fit subject upon which we could lavish praise, or that in any way catered to our finer feelings. But that period is now happily past; the exhibition of 1876 injected into us as a nation new conceptions of the ideal, the natural, and the beautiful in art. Symmetry, expression and truth in no class of composition were generally appreciated; amongst a small proportion of the cultivated there were, of course, exceptions, and I do not mean now that the whole country has so rapidly been educated in this particular; but I do maintain that a much larger number have been drawn to give time and study to this subject, and that the art-schools of Boston, New York, Philadelphia, Baltimore, Chicago, St. Louis and other portions of the country have been stimulated to achievements which are more than simply creditable. The influence which such institutions exert upon all the arts and manufactures of our country cannot be over-estimated; there is no rule by which it can be computed, and no basis upon which to form a rule.

But that all the purposes of civilization, purity and religion, or the opposite, can be greatly aided or retarded by the effects of art, there is not the slightest room for doubt. Eloquence, high power of analysis, and gentle persuasiveness are equally potent with delincative art in portraying to the mind the truths and principles which build up

[1] Continued from page 68, No. 476.

and strengthen character, and advance man in the paths of progress and industry, or that weaken and precipitate him in the sea of debauchery and indolence. From the earliest times man has been enervated by such grossly sybaritic but artistically executed designs, so common upon the tiles taken from the ruins of Pompeii and other Italian cities; the luring songs of the siren have been effective in all ages; the downward path has at all times been easy to travel. To impede this and aid to combat it, art has also been employed in all its forms for good. Who can look upon the works of the gifted and chosen contained in St. Peter's, Westminster Abbey, Canterbury, and other cathedrals, and some of the priory churches of Western Europe, and view their paintings and mosaics on dome, ceiling or walls, tread their tiled pavements, formed in all kinds of beautiful figures, bordered with flowers and traceries of vines, fruits and geometrical forms, and then fail to feel the elevating influences of art?

The success of Low's tiles has been steady and at the same time rapid, for less than a year and one-half from the commencement of their production we find them in competition with the tiles of the most famous potteries in the world, with the results of long experience to guide the selection of the articles exhibited, as well as a large and great variety in stock from which to select, on the part of their competitors, while on the part of the American tiles the selection was hastily made from a then meagre stock, and hurriedly shipped to the place of competitive exhibition, which was at Crewe, England. The first premium was awarded to Low's exhibit, and it was for the "best collection of art-tiles of English or American manufacture, hand-painted, impressed or embossed, relievo or intaglio."

The American tiles for which the above premium was awarded have everywhere given the greatest satisfaction: they do not assert themselves by a general misapplication of colors. Brilliant pictorial colorings are not in any way objectionable when the design is properly executed and the colors harmonize, which is too seldom the case; but the Low tile resistlessly attracts by the very simplicity and beauty of the shades of the single tone of glaze in which its modelled reliefs are dreamily suggested, and which appear like seemingly breathing forms. These tiles have won their way by simple merit of execution, while many of the English tiles are upheld to-day not from any such cause, but simply upon the high and often inherited reputation of the house that produces them, while the heads of such houses are not and often never have been artists, nor have any of the junior members of the firm been so educated.

But to speak plainly, and I certainly hesitate, much preferring that some stronger hand than that which now holds this pen should write the words, I mean that English art in the whole line of artistic pottery has reached the highest point of development that it can ever attain under the present constitution of its society, and, what is more, it has been stationary, and is now on the decline. The many art-schools which are established in various parts of the kingdom may impede somewhat this fall, but the ultimate and complete destruction of this branch of art is, under the present system, but a simple question of time.

The saying, "Once a potter, always a potter," is literally true of England, and if any interpretation can be put upon it, it means that they form a separate class or caste. However deserving, how many among those decorative artists who have reached the topmost points of their professions during the past decade have attained the absolute control of any decorative-pottery manufactory in England? How many to-day are even admitted into the different firms, in any sort of interest to entitle them to the slightest control? Alas, not one, and potters they must stay. They cannot break away from the chains which hold them in their caste; they cannot establish themselves, no matter how much merit they possess; potters they must live, and potters die, as their fathers have done before them. In the face of these facts, there can be but one result, or all past history is an error: to simply recall the effects of the caste system of Egypt is all that is necessary. It has been constantly the same; it is the great evil which has always and everywhere been destructive to art and progress. In Egypt the station of every man for life was fixed by caste, and the individual could not make his own way and fortune in the world, but must follow the accident of birth, and if his father was a potter, he must be one also. In England, of course, there are no such laws written in the books and enforced, as other legal enactments, but it is written and stamped into the customs of society, and such customs are often of much greater force than the strongest legal measures could possibly make them.

There is a freedom and encouragement in art matters that is innate to America, and that does not exist in England nor so largely in any other portion of the world. It is true that there has been in our country during the past nearly quarter of a century an absorbing ambition for money-getting, which is only a natural consequence of the effects of our great civil war, the founding of an extensive and liberal system of banking, the enormous construction of railways, and other means for communication, and the consequent unprecedented development of our manufactures. But with all this rush for wealth, art and progress have not suffered, for many who took pleasure in its accumulation have also experienced pleasure in its proper distribution. Those who had families rejoiced in giving to their children the means of education and culture, and those with families and those without have also been liberal to the public. Art schools and galleries, universities and colleges have been founded almost without number. Girard College, Johns Hopkins University, Lehigh University and other institutions, as well as libraries, art schools and galleries which it would require page after page to enumerate, are all the results of the strife for wealth; but in no other country on the globe has there ever been witnessed such liberal and unparalleled generosity to the public.

But let us return to our subject, from which we have strayed farther than was our intention. The glazed tiles for decorative employments are usually of four classes, and are commonly called "art tiles," enamelled tiles, embossed majolica tiles, and encaustic tiles. The first-named are usually hand-painted, and are employed largely for decorating grate cheeks, pilasters, and cabinet-work. The enamelled tiles are also employed for the above purposes, as well as for flower-boxes, wall-linings, string-courses, and other purposes of architectural decoration; and the embossed majolica tiles are also employed for the same purposes. Encaustic, plain and mosaic tiles are employed for pavements. Inlaid encaustic glazed tiles of extra thickness are used for hearths, and self-colored glazed tiles, of white, celedon, turquoise, olive and buff colors in squares, or of geometrical form, are largely employed for wall-linings.

Decorative tiles may also be described, according to their decorations, in another manner: First, those made with flat surfaces, and either of a natural or artificial monochrome, without designs, called "self-colored," or ornamented with surface enamel, or painted in outline, monochrome, or polychrome; second, those made with flat surfaces, inlaid in chromatic patterns to a slight depth, otherwise known as "encaustic tiles;" third, those made with designs in relief; fourth, those made with irregular, incised, indented or depressed designs, having texture in the depression. Either of the last two sorts may be painted in monochrome or polychrome, and either of the four sorts may be glazed either with a colorless glaze or with a colored glaze, or may be enamelled.

But up to the present time, so far as the writer is informed, only one class of relief tiles or intaglio tiles having texture in the depressions have been made in whole or in part by compression, out of clay-dust, and certainly no tiles excepting Low's, having undercut designs, have been made in any part out of compressed clay-dust.

In the production of his designs and tiles, Mr. Low proceeds as follows: he uses a plastic material, like paraffine, and places it in the tile-frame of the tile-compressing machine, and subjects it to pressure, thus producing a flat, thin, plastic plate, of about the thickness of a tile; or he takes a quantity of clay dust and similarly compresses it, and saturates this dust with paraffine. The upward-presenting surface of this plate is then plentifully sprinkled with pulverized plumbago, which is compressed into the surface of the plate, which may be engraved with any desired pattern. After engraving, care is taken to cover the plate with black-lead powder, brushed on with naphtha or any other solvent of paraffine as a vehicle, or dusted on to a slightly-warmed surface, or stippled on with a stippling brush. The parts of the plate denuded by engraving can be used as an electrotype mould to make a reverse, and the electrotype used as a matrix to make an obverse. These electrotypes, well backed, as when used for printing, and set in steel or other strong boxes, to prevent crushing the backing, will serve as dies for making the intaglios and reliefs for stamping tile in dry clay-dust. In case high reliefs are desired, the clay and paraffine plate may be carved as desired, carefully avoiding undercutting, and then covered with its plumbago surface by the naphtha process or stippling, and electrotyped and used as the die. When high reliefs, which it is desirable to undercut, are to be produced, the mould is made so that the compressed clay will draw, and the main part of the design being thus formed, the modeller carves the undercutting by hand, the clay being sufficiently tenacious when compressed to allow this, and the finished tile, partly hand-made and partly machine-made, is then fired.

For obtaining textures, low-reliefs, or intaglios of natural objects, Mr. Low preferably adopts the following manipulation: having formed the compressed plate, the lower platen of the tile-machine is raised until the upper surface of the compressed plate is conveniently near the top of the frame of the tile-machine. Bits of woven stuff, lace, pieces of embossed paper, leather, or other fabric, leaves, grasses, flowers, or other objects having suitable textures and outlines, such a design as will be attractive, are laid upon the plate, and the lower platen of the tile-machine is then let down to its place, and the upper plunger is then brought with strong compression upon the objects.

By the above means the patterns are indented in outline and texture in the plastic or clay-dust surface, even overlays being represented with an accuracy absolutely true to nature, and always in intaglio. As we have already stated, this intaglio may be used as a mould for electrotypes, when properly made, by the use of pulverized plumbago as a surfacing agent; but in practice it is usual to take this matrix so made, and place over it a diaphragm of thin, tough material. The best and cheapest substance for the diaphragm is the thin Japanese paper, of uniform texture and great toughness, such as appears in the Japanese handkerchiefs and napkins, so called. Upon the diaphragm, which must exactly cover the surface of the intaglio, there is next laid the dust of surface and body clay of the tile to be embossed, which is subject to compression in the ordinary way, and thereupon, on raising the plunger and platen, the intaglio and relief may be separated. The diaphragm always adheres to the relief, but is readily peeled from it, and if the intaglio is properly handled, it will be found uninjured during several hundred impressions. The sharpness and definition of texture of reliefs made from dust-clay intaglios are very remarkable, and a tile compressed from dust, from

its homogeneous quality, is much less likely to warp or shrink unevenly in firing than any other, particularly if packed in a less fusible powder, like quartz grains or canister, in firing, as is not unusual with terra-cotta relief work.

Of course the tiles made as we have described may have their intaglios filled with, or their reliefs covered with kiln colors, slip or enamel, either while simply clay or after firing, in any way and at all times proper in tile-making for such application.

CHARLES T. DAVIS.

[Please forward to the editors your vote for the best ten buildings in this country. See our invitation on page 86, No. 478.]

THE POLLUTION OF STORAGE RESERVOIRS.



Statue of Col. Beaurepaire. by M. Bourgeois. at Coulommiers France.

AT the regular meeting of the Engineers' Club, of Philadelphia, February 7, 1885, the Secretary presented, for Mr. A. Harvey Tyson, a paper upon the Sources of Pollution in Storage Reservoirs, from which the following is extracted:

"As City Engineer of the City of Reading, my experience concerning the subject of this paper is gathered from my connection with its Water-Works. Previous to the year 1880, during which the Antietam Lake, with a storage capacity of ninety millions of gallons, was constructed, the supply of the town was small. Citizens were satisfied with water of any kind — it was not a matter of quality, but of quantity. There was an occasional grumble about the condition of the water served consumers, but in a few days the impurities would disappear, and the state of public opinion would return to its normal condition. During the construction of the dam named, there was quite a perceptible increase in the impurity, as the water had a woody taste, and when left standing for five hours or more emitted a very disagreeable odor. This was attributed to the fact that the banks of the streams passing through the dam, and the flows of which were to be impounded, had been cleaned and grubbed. The bad taste and odor lasted for three weeks and then ceased. About the first of August of the next year it again presented itself; this time in a worse form, the odor remaining the same, but the taste had changed, and resembled that of fish-oil. The suggestion was made that there was a deposit of filth in the pipes, and with a view of removing such, if it was the cause, flush-valves were placed in all depressions in the pipes and at the dead ends, and these, as well as the fire-hydrants, were periodically opened. This did not remove the difficulty and improve the water. The parts of the city served directly from this storage reservoir were the only ones in which this impurity was noticed; those served from the distributing basins showed no signs of it. The entry into the latter was through fountains which threw the water to a height of seventy-five feet, thereby thoroughly oxidizing it and removing the impurities. An examination into the cause of the trouble showed that, instead of having the natural blue-green color, it had a bright green, and, when left standing, the impurity came to the surface and discolored it. Whenever, during the ten weeks within which the odor and taste remained, the thermometer for more than a day fell to below sixty-five or seventy degrees Fahrenheit, the impurity disappeared, to return again when the temperature exceeded seventy or seventy-five degrees. An examination of the lake developed the cause of the trouble to be a vegetable formation, which, when alive and scattered through the water, gave no noticeable taste or odor to the water, but, in its decay, became highly offensive. As to what this vegetable formation was, the botanists differed. My conclusion, on a microscopic examination, was that the growth was of minute confervoid algae, whose germ was the clorophyl, or coloring matter of leaves. The plant itself, when gathered from the surface, seemed to be without disagreeable taste or odor, but when exposed to the heat and light of the sun, rapidly fermented and became very offensive. This plant, when in subsiding reservoirs subjected to the sun's rays, grows rapidly, and, when drawn into the distributing pipes, the want of air causes decay, and, as a result, *taint*.

"With each succeeding year the trouble has returned, grows worse and remains longer. Nor is it local in its development. The result of correspondence with over one hundred towns and cities where water is impounded proves that the trouble has shown itself in a greater or less degree everywhere, and how to avert and correct it has been the problem worrying the hydraulic engineers. Numerous plans have been proposed, from oxidation by flow through open channels or artificial aeration, to the gigantic scheme of roofing in the reservoirs to remove the effect of heat and light, and so remove the cause of the development of this new but unpleasant affinity. Future experiment will demonstrate the most feasible plan, but, from my experience, I would say that natural aeration is the best, for the reason that the water in our small distributing reservoirs, which enters through the fountains as stated above, has always been pure.

"The trouble is comparatively modern. Ponds and sluggishly moving streams which were sweet twenty years ago, as I loitered along them, are now affected in a like way, without any change of conditions. They are affected by the climatic change which the country is undergoing. Steady rains have ceased, and the precipitation is sudden and rapid.

"Chemical analyses of our affected water have shown that there is nothing deleterious to public health, although it may be exceedingly disagreeable. Examinations for the last three years resulted as follows: —

	1882.	1883.	1884.
Free ammonia	.0028	.0027	.0035
Albuminoid ammonia . .	.0175	.0175	.0133
Chlorine	.2900	.2950	.3000

"Also, with the increase of pollution from this source, there has been a corresponding decrease in the death rate, which, from the records of the Board of Health, is as follows: 1880, 20.1 per 1,000; 1881, 21.0 per 1,000 (scarlet fever epidemic); 1882, 20.0 per 1,000; 1883, 19.0 per 1,000; 1884, 18.9 per 1,000.

"The facts as stated above, that this source of pollution is not deleterious to public health, should not allow engineers and local authorities, by an appeal to the purse, to let it pass by without some determined effort at correction, as it may tend to the development of some characteristic which would be damaging."

Mr. Charles G. Darrach discussed the subject at length. He said:

"Data collected during the past seven years disproves the old theory that, as an approximation, we may estimate a daily average yield of 1,000,000 United States gallons (133,370 cubic feet) per day, per annum, per square mile of catchment area, or the utilization of 23 inches of rainfall. In fact, but one-half this amount should be estimated. We are, therefore, forced to increase the storage capacity to tide over dry years, calculating the average yield of twenty-four or thirty-six months, instead of twelve months; in so doing, the depth of the collecting storage reservoir is increased, and it is to this point your attention is directed.

"In 1875 I noticed that the water, drawn from a depth of fifty feet in Tumbling Run Dam, was very offensive in odor; but after contact with the air the water became odorless and potable, similar to the water on the surface of the dam."

He then presented a detailed account of the similar trouble in the Baltimore water-supply, and his correspondence and experiments with Mr. Robert K. Martin, Chief Engineer, and concluded as follows: —

"In the paper before us it is stated that while the water drawn from the pipes leading from the collecting and storage reservoir was bad, it improved after being discharged into the distributing basins. Mr. C. S. D'Invilliers (member of the Club) informs me that it is his impression that the collecting reservoir for the city of Reading (that mentioned in the paper) is about seventy feet deep,[1] and that its capacity is great compared with its catchment area. I do not remember the data of the completion of this reservoir, nor the length of time the water has been stored; it is probably two or three years. Light would be thrown on the subject did we have before us all the data as well as the plans of the reservoir.

"From the data furnished by Mr. Martin, the water in Druid Lake seems to have fouled in two years, from 1881 to 1883. A theory which these facts seem to indicate is that products of *decaying* vegetation sink to the lower water in deep reservoirs, where decomposition is suspended for want of oxygen, the gases are absorbed by the water, which gases, upon contact with the air, are fully oxidized.

"As a prevention, surplus water should be wasted from the *bottom* of the deep reservoirs, and not over the weirs; as a cure, *aeration*, by means of shallow distributing reservoirs, receiving the water on the surface. and, if possible, from fountains.

"In 1881 the newspapers of Baltimore stated that, as chemists had failed to discover impurities after testing the water which caused complaint, it was probably because Dame Nature had forestalled them."

Dr. H. M. Chance was of the opinion that in the great fresh water lakes we had conditions analagous to those present in artificial storage reservoirs, and therefore asked if any member could tell whether any examinations had been made into the condition of the water at considerable depths. If this was found to be fresh and of good quality, similar, in other words, to the water near the surface of these lakes, then an inquiry into the conditions which protected it from contamination, or purified it, would be of great value; but if, on the other hand, the water at great depth was found contaminated in the same way as that in storage reservoirs, then it would be useless to look for any natural phenomena to assist in purifying stored water,

[1] The Secretary has since learned from Mr. Tyson that the Reading reservoir is forty feet deep, and water is drawn at three depths: twelve feet, twenty-four feet, and thirty-six feet. Mr. Tyson adds: "Thinking that the defect in our water was caused by the draught (through the defective construction of the valve tower) of bottom water, an outside stand-pipe, with valves at the same height as above, was constrncted this autumn. What the result will be, next summer must demonstrate."

and reliance must be placed upon some artificial method. He believed the subject was of sufficient importance to warrant an immediate investigation into the character of the deep water of these great lakes, and thought that, until this was done, sanitary engineers, in declining to avail themselves of this knowledge of natural laws, were committing a great mistake, and were necessarily working in the dark.

[*Please forward to the editors your vote for the best ten buildings in this country. See our invitation on page* **86**, *No.* **478**.]

A FEW HINTS ABOUT SOUND CASTINGS AND FACTORS OF SAFETY.[1]



So many disturbing elements intervene between the conception of a design in cast-iron and the completion of the work in the building, that we all have to allow what we call a factor of safety (aptly characterized by the late Alexander L. Holly, C. E., as a factor of ignorance) to cover these contingencies, varying from three, or one-third the breaking strain in very simple cases where the quality of the castings can be depended upon, to five or even ten where the design is more intricate, or the liability to shrinkage strains, hidden defects in the castings, rough bearing surfaces or uncertain variations of the load are possible. Much can be done by designers of cast-iron work to reduce this factor of safety, and consequently the weight and cost of castings, by giving serious consideration to the many processes and changes of condition through which their designs pass on the road to the building. Foundrymen exercise great ingenuity in producing any design in iron that may be presented to them; still it is possible to design things that are totally impracticable in cast-iron, in which case the designer would probably be asked to modify his drawing, but when it is possible to carry out a design without change it is the almost universal practice to do so without comment and without recollection of the fact that the resulting castings may have very serious shrinkage strains or other defects, which would reduce the strength far below what the designer expected. For instance a column, say sixteen feet long, eight inches in diameter, three-quarter inch metal, is sometimes designed with a heavy projecting base moulding near the bottom, say twelve or fourteen inches in diameter, giving three inches or more thickness to the metal at that point, also having an extension of the shaft to pass down through a shell plinth or pedestal, while at the top there is a shell cap and then a shelf, say twelve by twenty-four inches, for girders, made, possibly, two and one-half or three inches thick, to insure strength without the use of brackets or ribs. This, like all other architectural work, will be moulded in "green sand," which is moulding sand slightly dampened with water and rammed solidly around the wood pattern, forming a mould strong enough to withstand the wash and pressure of molten iron running into the mould. When we consider that iron weighs four hundred and fifty pounds per cubic foot, while water weighs only sixty-two and one-half, an idea may be formed of the strength of mould necessary to stand the wash and pressure, which, in a mould three feet high from the bottom of the casting to the top of the gate, where the iron is poured in, is fourteen hundred and forty pounds per square foot, nearly three-quarters of a ton on each square foot of surface: consequently the sand must be firm.

Now, realize that the pattern for this sixteen-foot column is made sixteen feet two inches long, to allow for shrinkage; also remember that when this shrinkage occurs something has got to give. The shaft of your column being only three-quarters of an inch thick, will solidify and commence to shrink, while the metal in your heavy base moulding and the shelf at the top is still fluid, and a little metal will run out into the body of the column as it draws away in cooling, leaving a little vacancy or depression in the upper part of the shelf or base. Presently these heavy parts will become about the consistency of cheese, but the shaft of the column keeps on cooling and getting shorter. Now the situation becomes serious. The soft metal in the base and shaft is not solid enough to allow the column to draw them bodily through the sand mould, so they stay where they are and the column shrinks away, stretching out more of the soft metal after it, making a weak place or leaving a nice little crack to be filled up with putty before the column is painted, and in an extreme case pulling away so much that the head will drop off when the column is hoisted out of the mould. Then the foundryman looks wisely at the column and says, "Now I will fix you," and puts a fillet around below the shelf, or a bracket, which will cool quickly and help pull, chipping out the bracket when the column is cold. In case all these fail, he just lays in some cold pieces of pig-iron before closing the mould, and they cool the heavy places off rapidly and everything is lovely. This last makes the soundest job in the lot, as they all melt down together; still there is liable to be dirt on the surface, and shrinkage strains that would not be there if the designer had made his metal in the shelf only one and one-quarter or one and one-half times as thick as the shaft, put in some strengthening ribs or brackets, and had also made his whole base shell, except a small bead or fillet, thereby justifying a smaller factor of safety and allowing all parts to cool at the same time. Mullion columns are often designed with a heavy square face cored out, which stands in front of the wood frames, while a thin web runs back between the sash-weight boxes. This is an exceedingly hard shape to cast without shrinkage strains. The cored part in front only radiates heat from one side (the core being quickly heated through), while the webbed back runs away off towards the remote parts of the mould, giving off heat on both sides, and the extreme back edge radiates in all directions but one, thereby cooling much faster than the front part, so that when the back has attained its length for normal temperature the front is still red-hot, and much longer. When the front cools there results a strain, which gives this column all it can do to hang together until it gets into the building, without doing its full share of work after getting there. Moral: A good, liberal factor of safety, or a nice large rib of metal, round or square, on the back of the web to keep it from cooling too fast. The privilege of modifying the thickness of parts of castings to avoid shrinkage strains is one that a designer can safely give a foundryman, for it is always cheaper to make castings right than wrong, to commence with. Still, any foundryman can call to mind numerous instances in which he has received serious rebuffs when he has volunteered advice which he considered good to designers who did not care to hear it, consequently they are often backward about volunteering their opinions. Unequal cooling and consequent crookedness of shell pilaster faces, frieze plates and light ornamental work is usually corrected by the foundryman without asking the designer's permission, as it is utterly impossible to get light work straight without providing for equal and uniform cooling. But in the manufacture of thicker pieces and parts intended to sustain loads of any kind, the foundryman never makes changes or asks permission to change, if he can possibly execute the work as per drawings received. Generally speaking, a more intimate association between designers and executors of cast-iron would result in a great saving of metal and a reduction of the factors of safety. Imperfect and unsound castings, owing to carelessness in the manufacturing, are much more rare than is generally supposed. Cold shuts from pouring the metal too cold, honeycombs, dirt and scabs from soft or unclean moulds are quite rare, and never dangerous in the work of reputable foundries. Many more bad castings are made through an honest endeavor to carry out a design which is not positively the best thing possible for the place than from carelessness in the execution of the work.

Among the most noticeable indications of shrinkage strains in finished castings is crookedness. One side will be shorter, thereby giving the whole piece a crook, or in the case of wide plates they sometimes appear with the centre perfectly straight and both edges "loose," or apparently too long for the centre. The same may be said of the thin back ribs sometimes put on mullion columns. This comes from the apparently long parts cooling first, so that when the heavier parts cool afterwards the light parts are left too long for their places, while the loss of strength incident to these causes is usually provided for by the enormous factors of safety used. Still, if designers would examine their castings carefully they would soon be able to design forms not liable to these defects, and reduce their factors of safety accordingly.

Any foundryman will be only too glad to show designers of cast-iron work through his shops, and will be able to point out many important conditions affecting the success and quality of castings, which our space will not permit us to mention. We feel confident that as architects and designers of cast-iron take a closer interest in the numerous processes of the foundry they will appreciate the fitness of and use cast-iron more frequently. C. W. Trowbridge.

[1] A chapter taken from the hand-book of the Union Foundry and Pullman Car Works of Chicago.

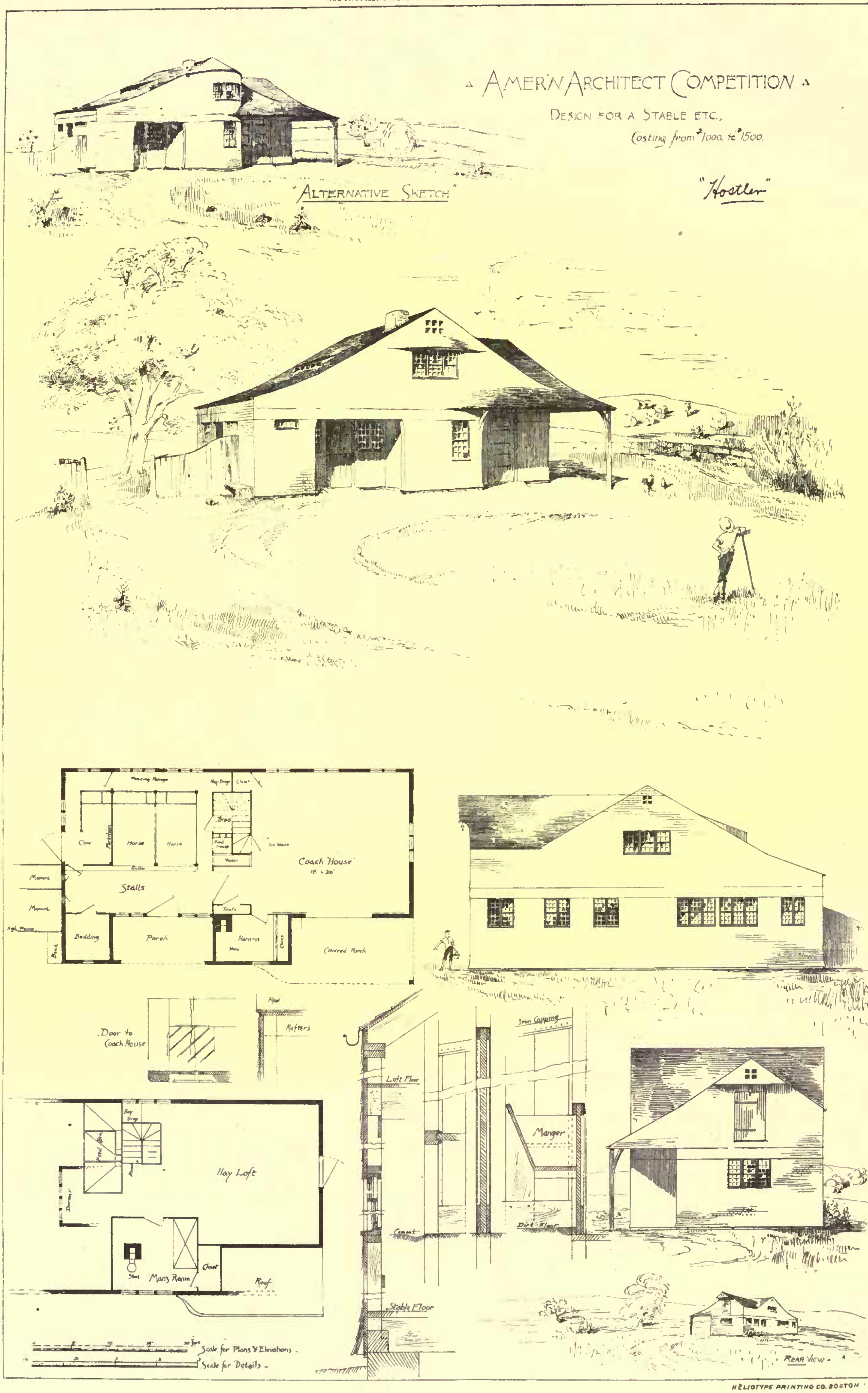
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THE ILLUSTRATIONS.

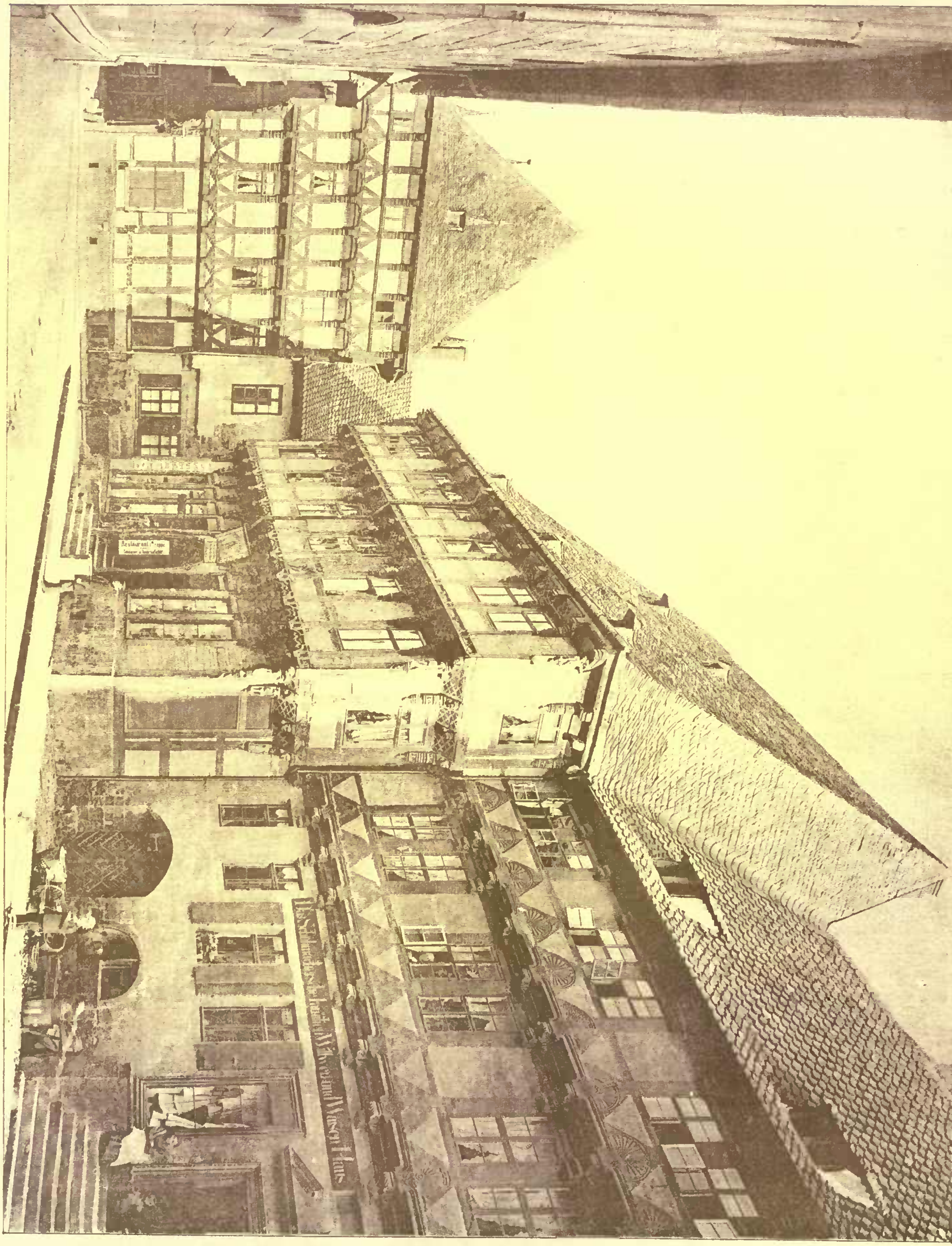
[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

COMPETITIVE DESIGN FOR BARN, SUBMITTED BY "*Hostler.*"

The building will rest on stone foundations 15″ thick, and 4′ below ground. The wooden sill to be 6″ x 6″, on which will rest 2″ x 4″ studs. Balloon-framing will be employed: hence, a 1″ x 6″ strip let into studs to receive upper joists which will be 2″ x 9″; lower joists 2″ x 10″. Rafters 2″ x 7″ resting on a 4″ x 6″ plate. The whole exterior to be sheathed with ⅞″ boarding, and this to have first a layer of thick felt paper, then to be covered wholly with shingles, which are to be left untouched by oil or paint. The coach room and stables to have ⅞″ x 3½″ strips of wood nailed horizontally on studs below window-sills, and about one foot apart. The coach-room to have double sliding-doors, but outer stable-doors to be halved horizontally, and hung on hinges. The harness-room will have cases with glass-doors. The ground floor will have 2″ plank flooring, except the floor behind stalls, which will be of cement, and the stalls which will have dirt floors with a rise of 2″ in the length. Mangers to be of wood. Stall partitions to be of 2″ planks. All to have galvanized-iron capping. The loft to have 1″ flooring. The joists and rafters all to show rough from below. In the alternative sketch, the harness-room with man's room would be rounded out to form the



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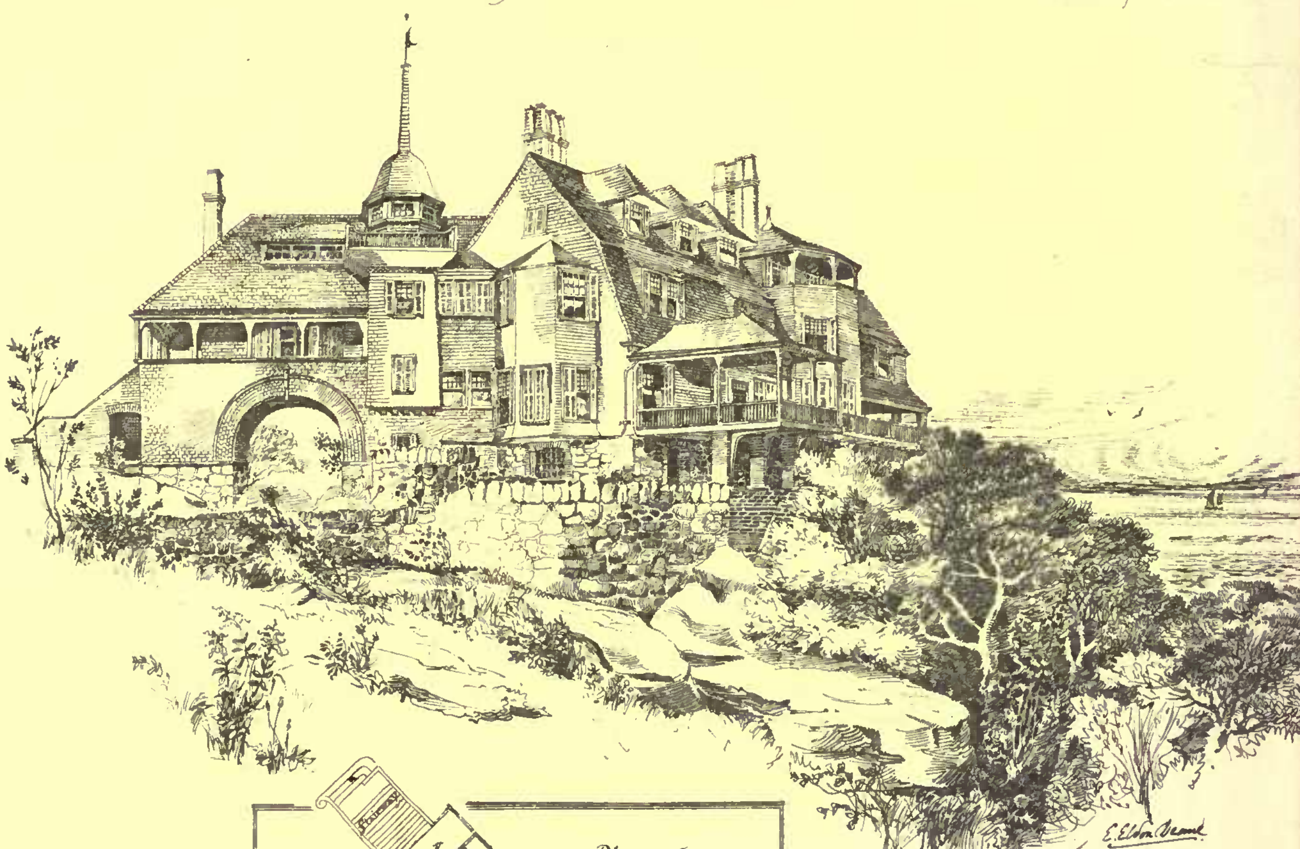
Old Houses, Halberstadt, Germany. 1884.

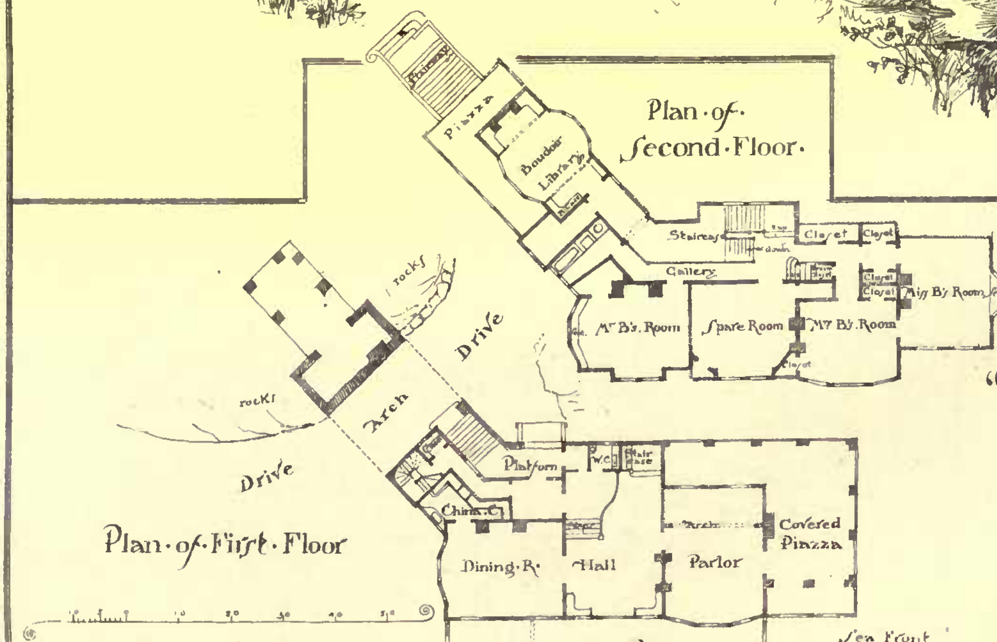
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Kragsyde

Sketch of Lobster Cove.





Sketches a
Manc
“KRAGSYDE

Summer Residence of
G: Nixon: Black: Esq
Messrs Peabody & Stearns
Architects Boston

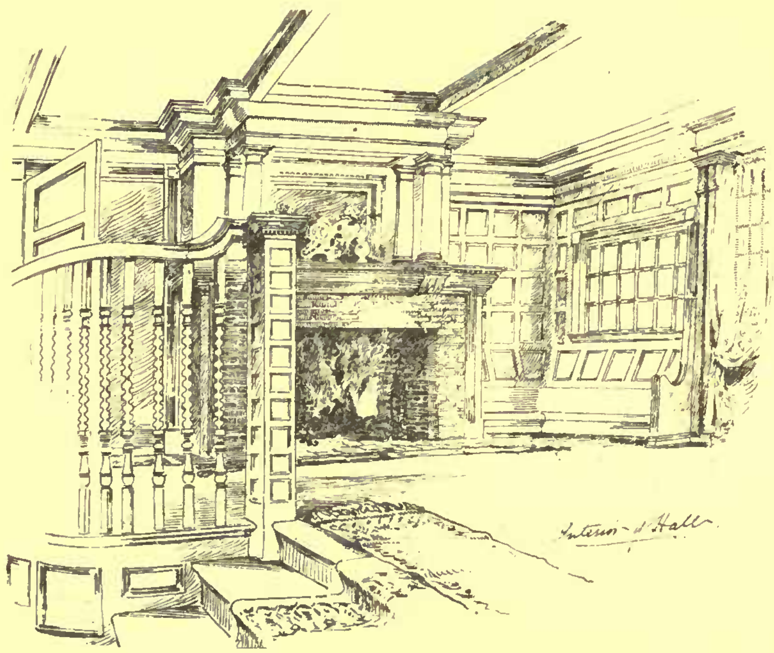
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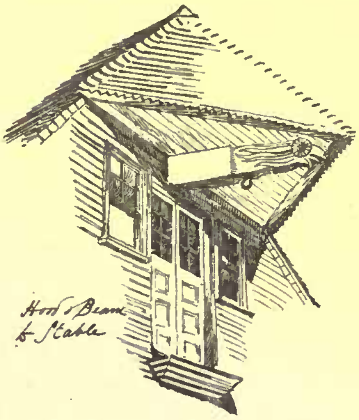


Library & Boudoir.





Interior of Hall.



Hood & Beam to Stable

...chester by the Sea



Sketch in the Vicinity



From the Drive

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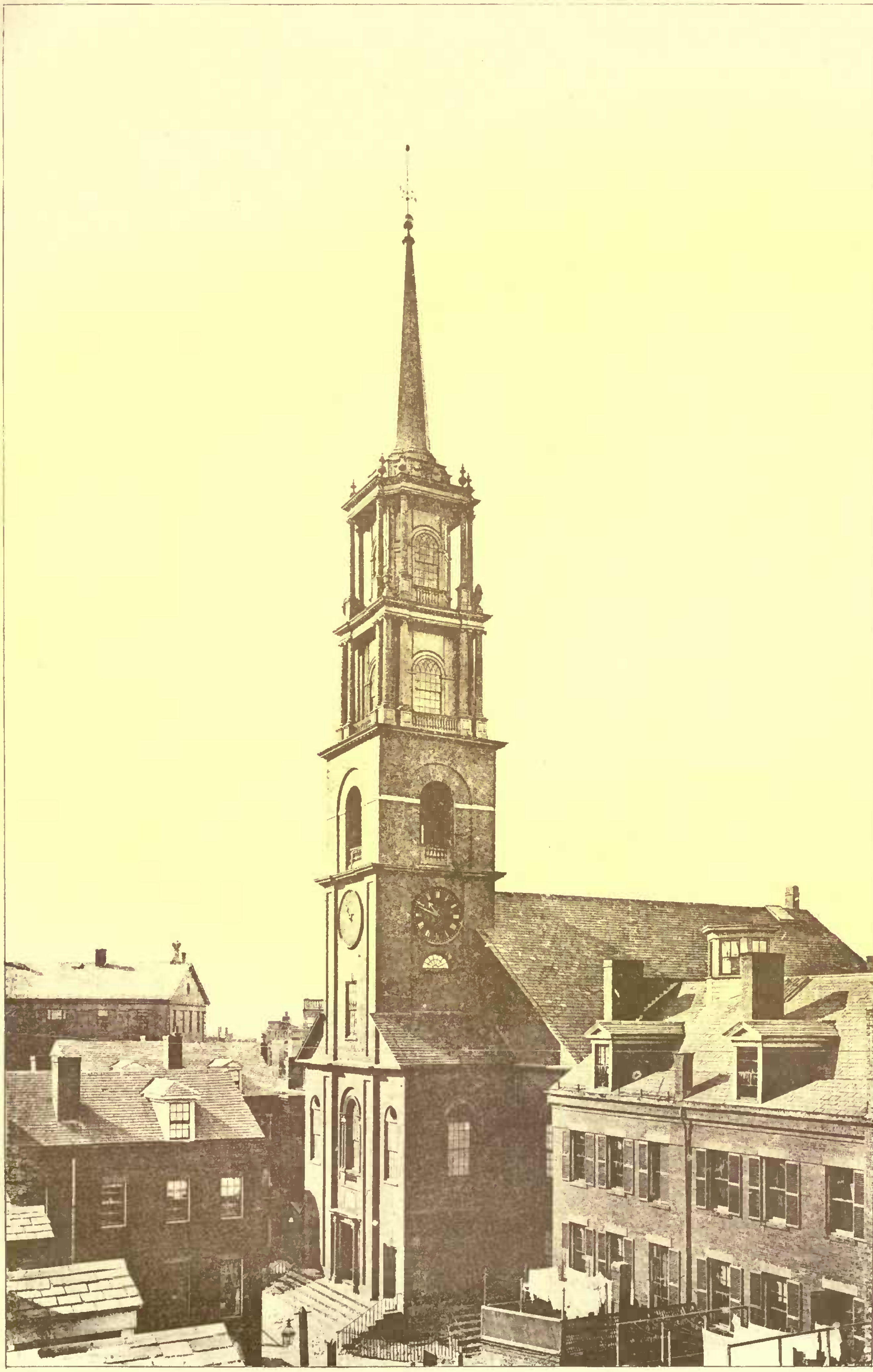
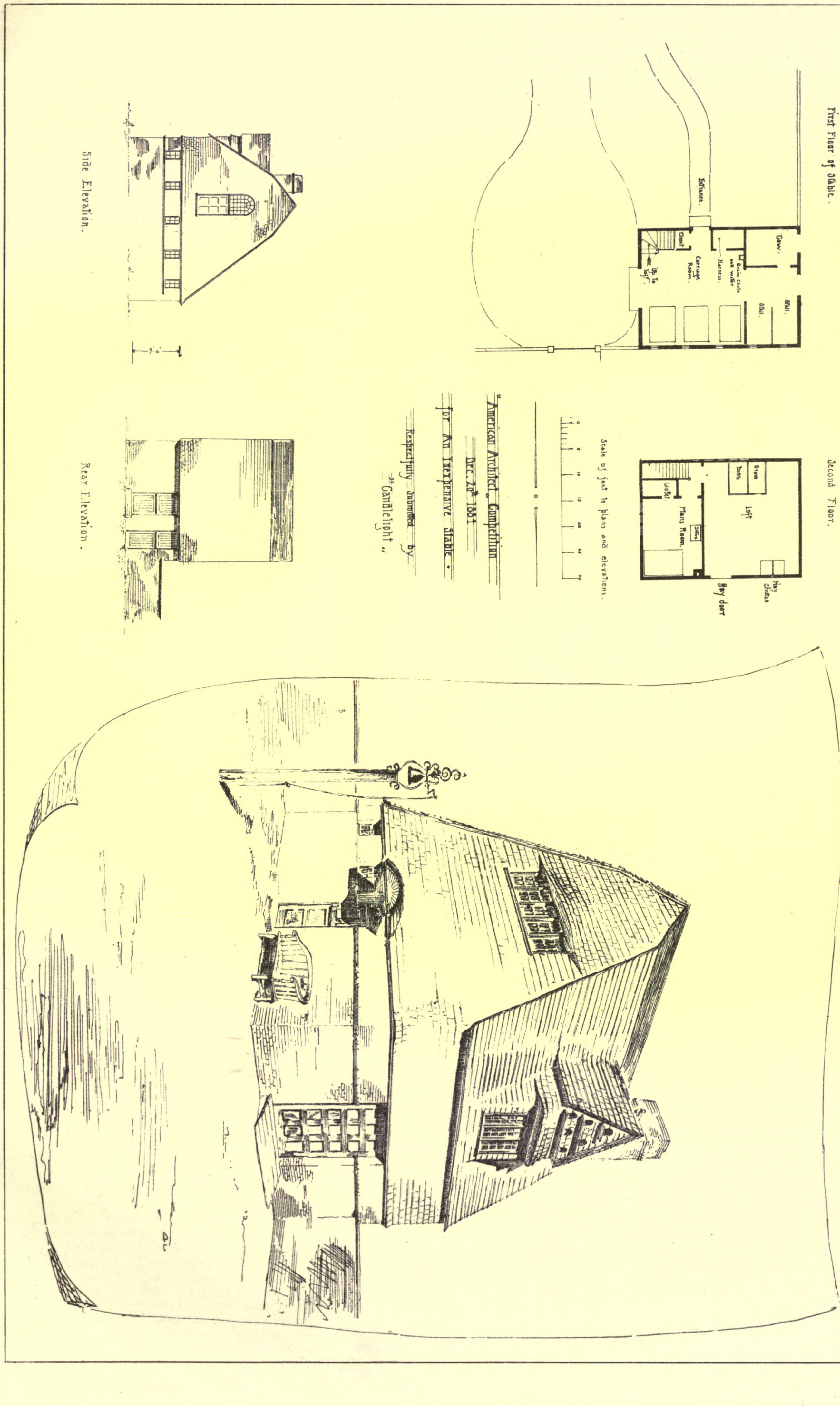


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Old Hollis St. Church, Boston, Mass.



First Floor of Stable.
Entrance.
Cow.
Closet
Carriage Room.
Harness.
Grain Chute and water
Up to loft
Stall.
Stall.
Second Floor.
Grain bins
Loft
Closet
Mans Room.
Hay Chutes
Hay door
Scale of feet to plans and elevations.
"American Architect" Competition
Dec. 20th 1884
for An Inexpensive Stable.
Respectfully submitted by
"Candlelight."
Side Elevation.
Rear Elevation.

tower. The area covered by the building (counting covered porches at one-half), is 1013 square feet; and the total cost will be $1,400.

COMPETITIVE DESIGN FOR BARN SUBMITTED BY "*Candle-Light.*"

FOUNDATION and first story of brick; second story of frame; sides and roof, common sawed shingles. No exterior painting, excepting frames, sash and doors. First floor, two-inch plank. Cow-stall with earth floor. The perspective sketch shows the detail as much as is necessary, all being of the simplest character. Your competitor has received an estimate from a reliable builder of New York, agreeing to erect this stable, as shown, for the sum of $1,365.00.

THE HOLLIS STREET CHURCH, BOSTON, MASS.

AT the present moment this building is being torn down that it may give place for a theatre, and thus shares the fate of so many churches in Boston, which within a few years have given way before the outstretching hands of Mammon: the church on Church Green, Brattle Street Church, buildings of venerable age and associations deserted by their congregations, have made way for warehouses, while churches known by their names have been erected elsewhere. Other churches of a less age have also been deserted, and either remodelled into stores or demolished. And now this church, one of the three remaining churches which are to Boston what Wren's churches are to London, is in the hands of the wreckers. We had always supposed that the building was designed by Charles Bulfinch, and are consequently surprised to find that the best authorities say the architect's name is not known. Bulfinch's church stood on the same site as this, but in 1811, when this church was begun, it was moved on to a large raft, and towed down to Bridgewater, where we believe it still stands. The architectural merit of this building is confined entirely to the tower and spire, which is exceedingly graceful, and to some excellent wood-work in the interior, of which we believe a partial use has been made in the society's new building.

STREET FRONTS, HALBERSTADT, GERMANY.

"KRAGSYDE," THE HOUSE OF G. NIXON BLACK, ESQ., MANCHESTER-BY-THE-SEA, MASS. MESSRS. PEABODY & STEARNS, ARCHITECTS, BOSTON, MASS.

[*Please forward to the editors your vote for the best ten buildings in this country. See our invitation on page 86, No. 478.*]

DIRECTIONS FOR TREE-PLANTING.



FIRST, see that the roots of the tree or shrub which you are about to plant are in proper condition. It should be provided with a sufficiency of small, fibrous roots, for it is from the spongioles at the extremities of these that the plant derives its nourishment. Trees vary in the form of their roots, from the dense mass of tangled fibres close to the crown, which makes the Rhododendron so safe to transplant, to the long, coarse, thick tap-root, which renders transplantation a dangerous process with some trees unless removed young. But these tap-roots emit from various parts tufts of fibres, and it is on these being uninjured and in sufficient quantity that the success of the planting will depend.

2. It is evident, then, that should it be found necessary to prune the root, the knife should be applied to the big coarse taps, but not to the fine, hair-like rootlets, all of which should be carefully preserved.

3. Let the hole dug to receive the plant be rather larger than required by the roots when spread out.

4. If possible dig the holes which are to receive the plant some days or weeks before the planting takes place, so as to leave the interior of the hole exposed meanwhile to the fertilizing influences of the atmosphere, rain, etc.

5. Rainy, or at least damp, cloudy weather is by far the best time for planting. Avoid as much as possible planting during sunshine or frost, or a run of dry weather.

6. If, for any reason, you are unable to plant your trees and shrubs for some time after receiving them from the nurseries, keep them meanwhile in some cool, dark shed, with wet moss or matting flung over the roots. These must be carefully guarded from three enemies, viz., frost, drought and light. Sunshine is death to roots.

7. In planting, see that the fibrous roots are not cramped or tangled in a mass, but spread them out carefully, so that they occupy nearly the same positions they did before the plant was taken up.

8. If the tree has been reared in a pot, the roots will most likely be found coiled up spirally into a dense mass. If so, they must, before planting, be patiently unravelled, and the fragments of pottery placed for drainage extricated. In doing so, care must be taken not to injure the extremities of the rootlets, which must be placed as deftly as possible in the hole, and spread out in such positions as that, when they grow, they shall not resume the twisted form.

9. Beware of planting too deep. The tree should not be fixed in the ground lower than will bring the soil, when the hole is filled, one inch or two inches above the collar of the tree. The collar is the spot where the ascending axis (the stem) meets the descending axis (the root). Thousands of young trees perish annually from being planted too deep. In situations exposed to violent winds it may be allowable to plant a little deeper; but it is only meeting one evil by substituting another, and it would be preferable to undergo the expense and trouble of staking the young trees where it is required.

10. When the plant is placed in the hole, and the roots well spread into their natural position, half fill the hole with some fine soil, different, if possible, from that in which the hole has been dug. Then shake this soil into the interstices between the roots, by gently pulling the stem up and down just enough for the purpose, and afterwards tread the soil lightly in. You may then proceed to fill up the hole, and, when done, again tread the soil in pretty firmly before making the surface neat.

11. See that the stem, when planted, be quite perpendicular. If the tree is of such shape or size that the wind may sway it about and thus disturb the roots, it should be fixed to a firm stake till it has become settled. See that the stake is so attached that it shall not, by its contact, fray or wound the bark of the tree.

12. If the soil be very dry at the time of planting, mulching must be resorted to. That means watering abundantly, and in relays as the first watering gets absorbed, so as to make sure of saturating with water all the ground about the roots. Mere sur ace watering is a sham. You must water abundantly and repeatedly, till no doubt remains as to the water (which percolates very slowly through dry, dusty soil) having reached the lowest roots; anything short of that is useless.

13. Avoid planting on raised soil or mounds, unless in very exceptional cases, such as low, damp, swampy spots. Unless in very wet seasons, very little of the fertilizing rain reaches the roots of trees planted on mounds, as the sloping sides of the mound carry the water, as it falls, away from the roots of the tree, to be wasted in the surrounding ground. Plants thus deprived of their fair share of moisture never thrive well, and in dry summers often die. If you take up a tree thus circumstanced, you will find the ground about its roots quite dry and parched.

14. On the contrary it is a good practice to scoop a kind of shallow basin round young newly-planted trees, by slightly elevating the soil at a little distance round the stem, thus inclining it inwards towards the plant. In this way the rain, as it falls, is directed towards, instead of being conducted away from, the roots.

15. In planting raised banks for hedges or screens, bear in mind the above, and let the top of the ridge, on which the plants are set, be hollowed a little, so as to incline the water-shed towards the roots.

16. When a tree is planted on a lawn or any other grassy site, do not let the herbage come close up to its stem, but cut away a circle of the turf of larger or smaller diameter, according to the size of the tree. As a rule (of course with exceptions), the roots of a tree extend as far as the extremities of its horizontal branches, and that should be (until a tree has grown large) the measure of the circle that is to be bared of turf and left open to the beneficial influences of the air, rain and sun.

17. With trees planted in unturfed soil, similar care is to be taken not to allow rank and tall weeds to grow within a certain radius of the stem. Many a young plantation has been ruined by the encroachment of luxuriant weeds, which monopolize the nutriment of the soil, prevent the access of rain and sunlight, and choke the foliage of the lower branches of the trees.

18. As a rule, trees, especially Conifers, dislike coarse manure about their roots; but decayed turves, rotten leaf-mould, and indeed any mixed refuse or rubbish, especially if of a different nature from the soil in which the plantation is made, form composts which wonderfully stimulate the growth of newly-planted trees.

19. If a plantation be made in stony soil, do not remove the stones. To many trees they are rather beneficial than otherwise, and to very few do they seem detrimental. Experiment has proved that the removal of stones from stony land impairs its fertility to a remarkable degree, at least for some years.

20. In the purchase of grafted or budded trees, see that the union between the graft or bud and the stock be properly effected. Sometimes (and this chiefly occurs amongst Continental growers) a slim graft is embedded on a thick bludgeon of a stock out of all proportion to it. Sometimes it is a vigorously-shooting species that is wedded to a slow-growing stock which cannot furnish the quantity of sap required. In both cases failure sooner or later is the result. In budded plants it is the stock that is generally the most delicate part. Unless it is healthy and well stored with sap, the bud, however vigorous at first, will gradually decay.

21. For choice and delicate trees and shrubs, and generally for such as are liable to injury from the cold of our climate, do not select the lowest and most sheltered spots to plant them in; in valleys and enclosures they suffer more from frosts than in more elevated and open situations. The protection required by plants that are impressible to our climatic conditions is rather the screening them from the

bitterness of our north-east winds in spring than the shutting them out from healthy summer breezes. In closely-secluded nooks and dales such plants are stimulated into early growth in spring and late growth in autumn, and in both cases the tender, sappy shoots are unable to resist frost. In more open and exposed situations the growth is shorter, but the wood of the shoots is better ripened.

22. In peaty soils there generally exists between the surface-peat and the subsoil (whether sand or gravel) a stratum, from one inch to six inches thick, of a hard, gritty substance, impermeable to water, which is locally denominated "rust" or "pan." Until this "rust" or "pan" be quite broken through by the process of trenching (for which a pickaxe is generally indispensable), it is in vain to plant in such soil, as it will nourish nothing but the indigenous heaths and Scotch fir. But once trenched and the "rust" broken through, the land becomes very fertile and peculiarly well adapted to the growth of trees and shrubs of all kinds.

23. Plants reared in peaty or similar light soils bear transplantation better than those grown in heavy lands. The reason is, that in light and porous soils the roots are mostly globed into fibrous tufts near the stem, whereas in strong land the roots of plants wander farther away in search of moisture, etc., and through a denser medium, so that they become elongated and coarse. All tap-rooted plants, whether the tap-root be congenital or superinduced by the nature of the soil, should be transplanted while young; otherwise they have little chance of surviving the process. Hence it is that young plants growing spontaneously in woods, whether self-sown young trees or suckers sent up by older ones, and generally saplings undisciplined by nursery cultivation, scarcely ever survive transplantation. Plants with fibrous roots are generally taken up with "balls," that is with more or less of soil clinging to the dense trusses of roots, and in that state transplantation is a safe and easy process. Of this rhododendrons afford a striking instance, as, when taken up with good "balls," they can be moved with impunity at almost any season of the year.

24. Trees and shrubs intended for transplantation should not be left more than two years without being moved or (which in most cases is equivalent) "spaded." This last process consists in passing a spade (or other tool peculiarly constructed for the purpose) round and under the tree, so as to cut off the tap-root (if any) and to confine the lateral roots within a certain given space. This work should be done in the early autumn, so that there may be time for fresh rootlets to be pushed forth inside the ball, to replace those which were cut off outside of it. A plant so treated will hardly ever fail of successful transplantation, as it is isolated from the surrounding soil, and, when transplanted, will extend its roots in its new locality without sensibly feeling the difference.

25. The safe removal of large trees is ensured by a process identical in principle with the above, but on a proportionately larger scale. A trench is dug round the tree, one season before its intended removal, at such a distance from the main trunk as may be considered sufficient to leave roots enough attached to the tree to feed it when removed to its new position. This trench cuts off all the roots extending beyond its inner circumference. The spade or other special tool is then pushed successively from all parts of the trench as far under the roots of the tree as possible, so as to intersect the "tap," if any. The trench is then filled in, and the tree proceeds during that season to develop fresh rootlets within and around the "ball" left inside the trench. By the ensuing season this ball will contain within itself all the roots necessary to the life and growth of the plant. Then, by proper machinery of a simple nature, both the tree and its ball of roots, with plenty of soil adhering to them, can be lifted up and safely removed to the new site which the tree is intended to occupy.

26. Transplanting may be performed at any time from October to April, according to the nature of the season. But the universal canon to be observed is to plant as much as possible during wet or cloudy weather, and to refrain in sunshine, drought or frost. Such intervals of forced inaction may be profitably employed in settling the spot where each tree is to be placed, in digging the holes and in providing the compost to be put round the roots when the planting is performed.

27. The sooner after the receipt of the trees from the nurseries they are finally planted the better; but if there must be some delay in planting them, it is better to keep them in a dark shed, as before directed, than to "lay them in by the heels," as placing them hurriedly and temporarily into the ground is technically called.

28. In moving trees of any size it is advantageous to place them, when replanted, in the same position with respect to the cardinal points, as they occupied before being moved. In other words, it is best that the same side of the trees should face the west, for instance, as faced the west before removal.

29. Do not unduly cut up your grassy expanses by dotting too many single specimens, or, worse still, too many flower-beds or small clumps over its surface. What single specimens you do plant should be of the very finest or rarest species. If Conifers, they should feather to the ground; if deciduous trees, they should be of such species as that, when the branches are allowed to ramify five feet to six feet high on the trunk, they should dip to the ground, as in the tulip tree, catalpa, horse-chestnut, and many other trees. Amongst them may also be interspersed a few pendulous trees, which, when not too numerous, add a peculiar grace to the scene.—*Heatherside Manual.*

[Please forward to the editors your vote for the best ten buildings in this country. See our invitation on page 86, No. 478.]

THE *AMERICAN ARCHITECT* STABLE COMPETITION.—III.

THE JURY'S AWARD.



NICHE, FROM BARCELONA, SPAIN.

"*MUCH in Little Space.*"—The plan has several weak points. A cow-stall opening from a harness-room is neither convenient nor good for the harnesses. The harness-room is not conveniently near the stable-room. The fireplace in the man's-room necessitating an expensive exterior chimney is a luxury. There are too many motives on the exterior. The rough-cast plaster could be omitted. The mass is good, especially the roof; but the hood over hay-door, outside chimney, man's-room window and hood over man's-room door are not well arranged in regard to each other. The rendering is good throughout.

"*Hay-seed.*"—The plan is good. There is but little room for hay in the loft. The cow-stall should be separate. The detail is simple and good. The exterior mass is uneven. There is too much mass over the man's-room to balance well with the other end of the building; it would have been better to carry out the loft over the carriage-room with a gable instead of hipping it back, and by this means more hay-room could also be gained. Rendering is good.

"*Frizzle.*"—The carriage-room door should be shifted to the left, to allow a carriage to enter while others are in the carriage-room. On the exterior the gable over man's-room with long and short rake would have been better reversed, with the long rake sweeping away from the central mass of the stable: otherwise the mass is simple and good. The rendering is clear, but a little scratchy.

"*Pitchfork.*"—The harness-room is inconvenient. The cow-stall should be separate. The proportions of the two pitches to the gambrels is not quite right. This design occupies in merit one of first places after the prize designs, but was unfortunately overlooked when the first criticisms were written. The rear elevation is particularly good. The rendering is excellent.

"*Pen.*"—The entrance to stall-room from carriage-room is inconvenient, and the carriage space will hardly allow a carriage to be driven in; otherwise the plan is good. The exterior mass is simple and good. The scroll-work about the windows is unnecessary. The ventilator is too thin, too high and poorly designed. All the curved surfaces in the building are exaggerated. The rendering is fairly good.

"*Festina lente II.*"—Plan is good. Harness-closet inconvenient. Mass good: it would have been better to gable over the hay-door, the curve over the hay-door is too high to be agreeable. Carriage-room windows unnecessarily large. Ventilator needs more projection of eaves. Rendering scratchy, too many short lines, not enough long ones.

"*Wild Oats.*"—Plan good. Mass of elevation good, but expensive. Ventilator too high. Details simple. Rendering hard and dry.

"*At the Eleventh Hour.*"—Harness-room needs door to stable-room. Fireplaces unnecessary. Exterior effective and picturesque, looks more like a cottage than a stable; very expensive. Whole design shows hurry, as the motto seems to indicate.

"*Beginner.*"—Plan good throughout. Exterior simple and good. Eaves should be stronger. Hay-door too large. Carriage-room windows too high. Drawing shows the work of a "beginner," and is uncertain, but intelligent.

"*Mars.*"—Plan expensive, with much waste room. West elevation uneasy; it would have been better for the mass of the building to have omitted the angle cut off from the man's-room, and finished above with gable. Rendering too black, *i. e.*, too much shaded.

"*Tom.*"—Plan has waste room. Harness-room should have a door into carriage-room. Man's-room too large; fireplace a luxury. Stone chimney, *tourelle*, etc., expensive. Exterior picturesque, but uneasy. Rendering vigorous and good.

"*Martin Chuzzlewit.*"—Plan good. Harness-room inconvenient. No hay-chutes to stall; horses to be fed from large hay-chute in stable-room, which would be inconvenient. The exterior would have been excellent if the ventilating tower had been omitted, the projecting hay door gable made symmetrical, and a ventilator of good design placed

over main ridge. The present ventilator expensive, and is not agreeable in design. Details are good, as is also the rendering.

"*Old Apple Tree.*" — Harness-room much too large; otherwise the plan is good. On exterior, the man's-room cuts the roof up badly. General mass of design is good. Details are carefully studied and good. Rendering good.

"*Youngster,*" "*Light Weight*" and "*Nyphite*" send in designs rendered in the same style, and of the same type of details. In the matter of detail the strong projection at the eaves producing heavy shadow is effective. All the lighter work such as porch, posts, brackets, etc., are too light and thin. The mock open-timber work in the gables isn't worth doing. The rendering is too much "all-over," the constructional lines are constantly sacrificed to the delineation of petty details, joints of shingles, etc., and these in their turn are done in a spotty manner. The foliage is especially scratchy.

"*Youngster.*" — First story of stone makes building too expensive. Plan a good one. Eaves thin. Ventilator too small and thin.

"*Light Weight.*" — Carriage-house too narrow. Harness-closet needs light and air. Carriage-room windows too large. Stone first story too expensive.

"*Nyphite.*" — Entrance to carriage-room should be carried to left to allow carriage to enter. Cow-stall should be separate. Details studied carefully in construction, but need study in mouldings. A battened wall always is disagreeably cheap in appearance.

"*Far Niente.*" — Plan good; stalls well arranged. Harness-case small. Staircase inconvenient. Exterior, mass good. Dormer to left, unsymmetrical. Battered wall is not agreeable. Details thin; turned work in gable unnecessary; rendering hurried.

"*Check-Rein.*" — Plan very good. Exterior has same fault as those of "*Tom Pinch, II*" and "*Martin Chuzzlewit* in regard to the ventilator and gable. Details simple; rendering labored.

"*Spinabout.*" — Carriage-room will not allow carriages to drive in. Harness-room too small. General mass good. Gable needs study in proportion. Rendering needs study; is dry and hard.

"*Sunflower.*" — Plan good. Exterior more picturesque than quiet; could, however, by studying the proportions of the parts, be made into a very good stable. Detail about hay-door, especially the brackets, unnecessary and lacking refinement. Rendering hurried.

"*Convenience and Beauty.*" — Waste room in plan and in hay-loft. No necessity for two rooms for stableman. Extra work about hay-door on exterior is not only in the way, but is not good in design. General mass is too high, but good. Windows are all too high for their width. Detail is very amateurish and poor. Rendering is labored, especially on the accessories, which are badly drawn.

"*R. K. Teck.*" — Plan good. Cow-stall should be separate. Exterior overhang above shed seems to need supporting post. Ventilator much too high and thin; otherwise general mass is good. Rendering hurried and sketchy.

"*Soyons veridique.*" — Man's room opening from harness-room is inconvenient; otherwise plan is good. Exterior is simple but commonplace. Chimney is not good. Rendering dry and hard.

"*Boy Harry.*" — Plan is inconvenient. Exterior eaves would have been better carried around without break. Mass simple. Ventilator should be over main ridge for effect. Rendering labored.

"*Age quod agis.*"—Harness-room large. Cow-stall should be separate. Plan otherwise good. Front elevation good. Brackets need to be larger. Ventilator of bad design. Window breaking through strongly projecting eaves is never agreeable. Rendering scratchy.

"*Cabby.*" — Carriage-house will not allow carriage to drive in. Harness-room convenient. Cow-stall should be separate. Exterior very restless and uneasy. Ventilator very unhappy in design. Rendering fairly good; a little spotty.

For the Jury, C. H. WALKER.

[Please forward to the editors your vote for the best ten buildings in this country. See our invitation on page 86, No. 478.]

THE STABLE COMPETITION.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — As one of the competitors permit me to offer a few reflections. The interesting nature of this friendly competition and the little labor required to prepare the drawings, coming as it did during the dull season, led two of my friends to join with me in a wager as to our own efforts. When you editorily announced soon after the drawings were received that the number of competitors was large, and that seemingly one-half the designs had equal merit, there was a feeling among our trio (B. H. and W.) that the result was in doubt. I felt very confident, however, that B. would take a prize, and put myself on record to the effect that if there were two more worthy designs than his, I would like to see them. Well, the prizes are announced, and I fail to find two better than B.'s, from any point of view, my conclusions in this being re-inforced by the judgment of several competent critics. In regard to cost the three prize designs are all far beyond what $1,500 would give in the vicinity of New York. B.'s design has an area of about 700 square feet. The prize designs vary from 860 to 1000 square feet. In a case of this kind area is a fair test of relative cost. I would suggest in future competitions that the cost be assessed by an impartial contractor as if for execution near Boston. As it is now, it is very easy for any one to get an obliging builder to attach his name to an absurd price. Besides this, it costs less, I am told to build in Boston than New York. It is manifestly unfair then, where there is so small an amount to expend, that the cheaper rates of building of one section over another should play any part at all. Aside from the expense question, something might be said of the designs, which were greeted with profound astonishment by "we uns." The feelings of the jury, however, must be respected, and I am yours, etc., W.

[WE imagine that the "profound astonishment" of B. H. and W., is shared by just about one-hundred-and-one other unsuccessful competitors, and that the ratio between the satisfied and the dissatisfied would have been exactly the same however this competition might have been decided. Our correspondent's point about the comparative cost of the buildings is well taken: it would obviously be fairer to have one builder estimate on all the plans. But think of the cost of paying for one hundred and seven estimates! and who would pay for them? The competitors? — EDS. AMERICAN ARCHITECT.]

[Please forward to the editors your vote for the best ten buildings in this country. See our invitation on page 86, No. 478.]

TIMBER AND METAL ROOFS.

NEW YORK, February 21, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Please inform me through your journal where I will be likely to find a work on timber and metal roofs, illustrated, with details, and oblige Yours respectfully, D.

["*Iron Roofs,*" by Francis Campin, C. E., with wood-cuts and plates of roofs lately executed; Peter Barlow's "*Appendix*" to "*Tredgold's Elementary Principles of Carpentry,*" containing specimens of ancient and modern roofs, 64 plates and numerous wood-cuts; Emy's "*Traité de la Charpenterie.*" — EDS. AMERICAN ARCHITECT.]

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A HINGE FOR A HEAVY DOOR.

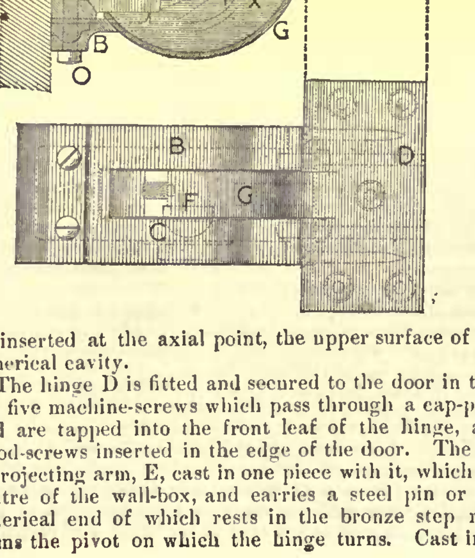
STAMFORD, CONN., February 9, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Some months ago we were asked by Messrs. Peabody & Stearns, the architects of the new Turner Building, St. Louis, Mo., to submit a design for a special hinge for carrying the very large and heavy front doors of the building, with the requirement that the hinge should transfer the door bodily from the closed position into another position at an angle of ninety degrees, the axis of rotation being found at a point four inches outside of the edge of the door, and within the thickness of the jamb.

The problem was an unusual one, and was complicated by the further fact that each door was double (*i. e.*, folded on itself), and of very large size, so that the weight on the hinges was, we believe, over half a ton, and the outward strain due to the overhanging of the door still greater.

The wall-box A is of cast-iron, and was firmly secured in place by the two anchor bolts N, N, as shown. Its top, bottom and rear wall form one casting, the front being open. A bronze cap B closes and covers the front of the wall-box, and is secured to it by the bolts, O, O. The contour of this cap is shown by the dotted line X, while that of the stone jamb is shown by the line Y. The cap thus projects slightly, and serves as a stop by which the moulding of the jamb is interrupted for the hinge. The wall-box, A, contains a bronze step or button, C, inserted at the axial point, the upper surface of which contains a spherical cavity.



The hinge D is fitted and secured to the door in the usual manner by five machine-screws which pass through a cap-plate on the back, and are tapped into the front leaf of the hinge, and also by two wood-screws inserted in the edge of the door. The hinge D, carries a projecting arm, E, cast in one piece with it, which extends into the centre of the wall-box, and carries a steel pin or trunnion, F, the spherical end of which rests in the bronze step referred to, and forms the pivot on which the hinge turns. Cast in one piece with

the hinge is also the cylindrical guard G, the two wings of which project on either side of it, and serve to fill the gap or slot in the cap B, so that the latter is always closed, whatever position the door may stand in.

Each door has three of these hinges. The wall-boxes being in position and the hinges properly attached to the door, the caps B are slipped over the arms E of each hinge, and the door then put in position, the gap in the wall-box being sufficiently high to admit the arm, E, with its projecting trunnion, F, so that the latter can be passed over the bronze step C, and seated in the latter. When this is done the several caps B are then pushed into proper position, and secured in place by the bolts O.

The whole of the work, excepting the wall-box, was made of the best gun-metal or bronze, and highly finished, so that the appearance of the hinges when completed was very rich and ornamental. They have proved very satisfactory in use, and we learn that, notwithstanding the great weight of the doors, they swing as easily and lightly as an ordinary house-door. Yours truly,

SCHUYLER MERRITT,
General Manager Yale & Towne M'f'g Co.

[*Please forward to the editors your vote for the best ten buildings in this country. See our invitation on page 86, No. 478.*]

OUR INITIAL CUTS.

PITTSBURGH, PA., February 28, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs, — Enclosed please find several initial sketches. I have been so very much benefited by your initial cuts that I thought perhaps some one else might profit by some sketches I have which were made several years since, and shall send them on from time to time.

We out here take almost, if not quite, as much delight in initials as in plates, and I hope you will continue to publish as many good ones as you can afford. I have preserved all of mine.

Yours faithfully, W. S. F.

[WE are glad to receive the sketches, and still more the foregoing letter, as it indicates that this feature of our "make up" has a value that does not exist merely in our own imaginations, as we have sometimes feared it did. If other contributors would bear in mind that the more subjects we have to choose from the better selection we can lay before them, we believe we should receive more contributions to this department of our illustrations. — EDS. AMERICAN ARCHITECT.]

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NOTES AND CLIPPINGS.

A NEW PROCESS FOR COLOR PRINTING. — The perfect reproduction of paintings, or even of Nature herself, in all the brightness and beauty of original color, has long been the object of inventive genius, and the rapid strides which photography has made of late have materially increased the chances of ultimate success. By means of photography we can readily reproduce all outlines and shades of objects or pictures, but a photographic print has but one color, and, therefore, necessarily often conveys a wrong impression where color predominates in the picture. An ideal way of reproducing various tints and shades would be to stop-out, by interposing colored transparent plates, all rays except those of one color, prepare a printing surface from this negative, roll this up with ink of as near the color wanted as it is possible to produce, and then proceed to the rest, printing one above the other, until by the blending thus obtained a picture like the original is produced. This, as we have said, would be an ideal method: in reality difficulties, at present insurmountable, are in the way, and therefore something less perfect but based on this line of working, must be considered satisfactory. The Universal Printing Company, of 280, High Holborn, have recently introduced a process called after its inventor, the Hoeschotype, for the photographic reproduction of colored pictures, which, as far as we can judge, seems capable of producing excellent results at a comparatively reasonable cost. The inventor has fixed at the outset upon only five colors to be used in his process, yellow, red, blue, gray, and black; these five form the base of a large key-map of tints, each one divided into five grades, containing, so to speak, respectively one, two, three, four, and five-fifths of any of these colors. In combining these tints by printing two or more above each other, a large variety of over 1600 shades are produced; the colors must of course be transparent for this purpose. To reproduce a picture, for instance a portrait, the painted original is at first photographed and copies printed. One of these copies is now taken in hand by an artist, who by means of his color scale ascertains for each spot in the picture the amount of yellow contained, and he covers that particular spot with an equivalent shade of gray, painting out with white at the same time all those parts or the photographic print which in the picture are to contain no yellow. This process finished, a negative is produced from this painted sheet, and a print taken on sensitized gelatine mounted upon plate glass. It will be understood that this gelatine print only represents a picture of those parts in which the artist wishes yellow to appear, and in different degrees of density. In other words, after this gelatine is washed, and rolled up with yellow transparent pigment, an impression can be taken from it on paper. In a similar manner gelatine printing surfaces are prepared of the rest of the colors, red, blue, gray, and finally black; they are all printed one above the other on one sheet in perfect register, and the result is a reproduction of the original colored picture, as near as the skill of the artist who prepared the copies for the colored plates, and the perfection of pigments will admit. There cannot be any doubt that tedious though this process appears, and depending as it does on the skill of an artist, the result is admirable, and we have seen excellent specimens of this work, and have moreover examined the working of the process. The glass plates carrying the gelatine film are placed upon the bed of what appears a well-built lithographic press. The ink used is very stiff, and the inking operation performed in the usual way by rollers, is repeated twice for every one impression to insure perfect distribution. The sheets are laid on to exact register, and printing by power is performed at the rate of about 100 copies per hour. The presses are capable of printing up to 25 inches by 35 inches in color, and if smaller subjects are worked two or more can be placed on one plate. Ink and paper are of course important items; in the former, shades must never vary, since otherwise the artist's tedious work would not be faithfully produced, and in the latter a certain texture and sizing are, we understand, most essential, but the finished pictures can be given any desirable texture by rolling. We have seen amongst numerous other specimens at the offices of the company in High Holborn, a reproduction of Mr. Alma Tadema's "Pandora," the picture which made him a member of the Society of Painters in Water Colors, and we were told by the secretary that so much pleased was the severe critic with the reproduction, that he gave permission for its publication. — *Engineering.*

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SLAG CEMENT. — We have on various occasions referred to the ingenious and very successful processes of Mr. Frederick Ransome, for the manufacture of cement from blast-furnace slag and lime. The discovery, made about twelve years since by Mr. Charles Wood, that slag run from the blast-furnace in a melted condition falls into a fine granulated state, removed one of the main objections to its utilization: the great cost attending its reduction to powder by mechanical means. One of the materials composing the Ransome cement is thus obtained ready for use, and being practically a waste product, its cost is nominal, the expense attending its application being limited to handling. By his earlier method the other material employed, chalk or lime, was ground and mixed with the slag, the combination being then calcined and again ground; from this resulted a cement possessing very high qualities, both as regards quickness in setting and strength. Very recently, however, Mr. Ransome, following the same line of investigation, has improved greatly on his former simple process, and he has found that the spent lime from gas-works may be employed with results as good as those obtained with lime prepared specially for the purpose. In order however, to get rid of the sulphur with which the lime is saturated when it leaves the gas purifier, Mr. Ransome resorts to a very simple and efficacious device. He mixes a certain proportion of powdered coal or coke with the slag and lime, and when this is exposed to the heat of the calcining furnace, the action of the coal or coke converts the sulphate into a sulphide of lime, that is subsequently entirely got rid of by the introduction of a jet of steam, which drives off the whole of the sulphur impurities as sulphuretted hydrogen, leaving the lime quite pure. This, however, is only one of the recent improvements to which we have referred. A highly important modification is the use of a revolving retort for the calcination of the slag and lime. It is found that after the materials have been thoroughly burnt in this manner, they remain in the same fine state of subdivision as when they were placed in the retort, and on being discharged will pass through a sieve of eighty meshes to the inch. The costly process of grinding, which is unavoidable in the ordinary method of manufacture, is thus avoided, while the cement is said to lose none of its useful characteristics in this novel process. Of course this system is equally applicable where fresh lime is employed instead of the waste material from gas-works, only in such a case it is unnecessary to add the powdered coke or to apply the steam jet. We have referred in general terms to the strength of the cement produced by this method; the following table of comparative tests made with samples of Portland and Ransome cement show clearly the remarkable qualities possessed by the latter; the samples in each case were one and one-half inches square, giving a sectional area of two and one-fourth square inches: —

Age of Sample.	Portland Cement. Breaking Load.	Ransome Cement. Breaking Load.
	lb.	lb.
2 days	510	740
3 "	693	870
7 "	818	1170
12 "	...	1300
15 "	...	1330
21 "	...	1440
28 "	936	
7 years	1327	

The foregoing figures speak for themselves, and indicate clearly that the Ransome cement possesses striking advantages over Portland, especially as it reaches a strength, within a few days, which is higher than the Portland after seven years. Very important advantages are also found in the simplicity of manufacture, and the suppression of the final process of the cement manufacturer, that of grinding. The plant used is therefore simpler and involves much less expense in maintenance and labor for the production of a given quantity of cement than is required in the ordinary mode of manufacture. When in addition to this it is remembered that waste materials are employed, it will be easily understood why the slag cement can be made for half the cost of Portland, and the commercial importance of Mr. Ransome's process will be readily appreciated. — *Engineering.*

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BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

312,610. WEATHER-STRIP.—Geo. W. Chinn, Bloomington, Mo.
312,616. ICE-ELEVATOR MECHANISM. — John R. Eccless, Waterford, N. Y.
312,658. SHEET-METAL ROOFING.—L. Lewis Sagendorph, Cincinnati, O.
312,669. DOOR-MORTISING MACHINE. — Frank W. Stevens, Lowell, Mass.
312,678. ATTACHMENT TO STOVES FOR HEATING AIR.—George A. Vaughan, Lockesburg, Ark.
312,683-685. FIRE-ESCAPE. — Herman Wettstein, Harvard, Ill.
312,685. WINDOW-SCREEN. — Marcellus L. Whitcomb, Muskegon, Mich.
312,687. WATER-CLOSET VALVE.—Peter White, St. Louis, Mo.
312,699. MACHINERY FOR OPENING AND CLOSING AUTOMATICALLY SAFETY-COVERS FOR ELEVATORS. —Alexander J. Blaikie, Rochester, N. Y.
312,782. ELEVATOR-HATCH.—Peter M. Wilson, New York, N. Y.
312,784. MIXED PAINT.—John B. Wood, Brooklyn, N. Y.
312,793. FIRE-ESCAPE LADDER. — Joseph Barnett, New York, N. Y.
312,819. LOCK.—Edward J. Colby, Cincinnati, O.
312,827. LOCK. — Thomas Donahue, James Roche, Willard T. Goodwin and William W. Cone, Terryville, Conn.
312,872. ATTACHMENT FOR WATER-SUPPLY COCKS. —Henry S. Lord, Hartford, Conn.
312,874. FIRE-ESCAPE. — Zacharias Ludwig, Oakland, Cal.
312,882. WATER-HAMMER PREVENTIVE. — Ferdinand L. Mentel, Cincinnati, O.
312,897. CONCRETE PAVEMENT.—Christian F. Rapp, Cincinnati, O.
312,899. FIRE-EXTINGUISHING APPARATUS.— William A. Reid, St. Louis, Mo.
312,903. VENTILATOR.—La Fayette Schanck, Rochester, N. Y.
312,908-910. FIRE-ESCAPE.—Frederick Schickle, St. Louis, Mo.
312,916-917. REVERSIBLE LATCH. — William E. Sparks, New Haven, Conn.
312,918. CHIMNEY-CAP. — Theodore J. Steen, Oakland, Neb.
312,920. REAMER. — George R. Stetson, New Bedford, Mass.
312,921. HYDRAULIC LIFT. — John S. Stevens and Charles G. Major, Battersea, County of Surrey, and Thomas W. Barber, Ulverstone, County of Lancaster, Eng.
312,926. COMBINED LOCK-LATCH AND HASP. — Hiram C. Stouffer, Cortland, O.
312,949. COMBINED SCREEN AND STORM-DOOR. — George F. Barber, De Kalb, Ill.
312,969. DOOR-HANGER. — John A. Carr, Walden, N. Y.
312,978. CHIMNEY-COWL. — Theodor Crüger, New York, N. Y.
312,979. EXTENSION-LADDER AND FIRE-ESCAPE. — John P. T. Davis, New Trenton, Ind.
313,000. TONGUING AND GROOVING MACHINE. — Frank B. Kearney, Grand Rapids, Mich.
313,024. FIRE-ESCAPE. George W. Putnam, Malden, Mass.

SUMMARY OF THE WEEK.

Baltimore.

APARTMENT-HOUSE.— Mrs. M. M. Hayes, of Boston, is to have a three-st'y and basement brick bachelor's apartment-house built on Centre St., near Charles St., to cost $10,000; from designs by J. A. & W. T. Wilson, architects.

ADDITION.—Messrs. J. A. & W. T. Wilson, architects, are preparing plans for Geo. L. Harrison, Esq., for a three-st'y brick addition, 25' x 50', at the cor. Eutaw Pl. and Lanvale St., to cost, $4,000.

DEPOT. — The Pennsylvania Railroad authorities are to erect a new passenger-station at Charles St. It will be three-st'y, with ornamental towers, 60' x 200', be of brick and Port Deposit granite, and cost $100,000.

BUILDING PERMITS. — Since our last report nine permits have been granted, the more important of which are the following: —

Mercantile Trust & Deposit Co., one-st'y and basement brick building, n e cor. German and Calvert Sts.

John Pursley, 3 three brick buildings, n s Biddle St., w of McKim St.

Chas. Caspari, Jr., three-st'y brick building, n w cor. Fremont and Baltimore Sts.

Jos. H. Rieman, three-st'y brick building, n s Biddle St., bet. Garden and Bolton Sts.

John F. Butzler, three-st'y brick building, n s Camden St., bet. Sharp and Hanover Sts.

John Mogarety, 3 three-st'y brick buildings, n s Preston St., w of Broadway.

Boston.

BUILDING PERMITS. — *Wood.— Milton St.*, near Whittemore St., mechanical building, 12' x 213'; owner, M. M. Zent; builder, Wm. A. Zent.

Milton Ave., No. 111, dwell., 21' x 28'; owner, M. H. Jackson; builder, M. H. Jackson.

East Fourth St., No. 634, carriage-house, 22' x 36'; owner, Edward Palley; builder, Eugene Sullivan.

Milton Ave., No. 10½, dwell., 27' x 32'; owner, M. H. Jackson; builder, M. H. Jackson.

Magazine St., No. 34, dwell., 17' x 45'; owner, Benjamin Bean; builder, Benjamin Bean.

Magazine St., No. 36, dwell., 17' x 45'; owner, Benjamin Bean; builder, Benjamin Bean.

Norfolk Ave., near Magazine St., dwell., 19' 3" x 35'; owner, P. J. Drury; builders, Potton & McLaughlin.

Norfolk Ave., near Magazine St., dwell., 19' 3" x 35'; owner, P. J. Drury; builders, Potton & McLaughlin.

Unnamed Pl., off Jamaica St., dwell., 21' x 31'; owner, Michael Schanney; builder, Thomas Tobin.

Fuller St., near Capen St., dwell., 20' x 36'; owner, Mary Carroll; builder, Neil Carroll.

Park Pl., near Myrtle St., dwell., 22' x 32'; owner, Paul Lincoln; builder, M. D. Ayers.

Longwood Ave., No. 30, dwell., 24' x 50'; owner, Anton Volk; builder, Gottiel Merl.

Lubec St., near Swift St., dwell., 20' x 30'; owner, Mary J. Roby; builder, Peter McCann.

Taylor St., near Water St., storage building, 31' x 91'; owner, A. T. Stevens Lumber Co.; builder, A. T. Stevens Lumber Co.

Dudley Ave., near Washington St., dwell., 22' x 30'; owner, Thomas Havey; builder, Thomas Havey.

Brooklyn.

BUILDING PERMITS. — *Sumpter St.*, s s, 200' e Saratoga Ave., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $3,800; owner, George Ullrich, 887 Tenth Ave., New York., architect and mason, Christian Baur; carpenter, Jacob Hertlin.

Wallabout St., No. 286, n s, near Marcy Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner, Chr. Reichert, 284 Wallabout St.; architect, H. Vollweiler.

Putnam Ave., s s, 90' e Tompkins Ave., 3 three-st'y brown-stone dwells., tin roof; cost, each, $6,500; owner and carpenter, Chas. Isbill, 593 Herkimer St.

Hancock St., n s, 30' e Bedford Ave., three-st'y brown-stone dwell., tin roof; cost, $7,000; owner and builder, S. E. C. Russell, Hancock St., near Bedford Ave.; architect, I. D. Reynolds.

Central Ave., s e cor. Himrod St., three-st'y frame (brick-filled store and tenement, tin roof; cost, $5,000; owner and architect, Jacob Essig, 92 Stanhope St.; builders, Wm. Maske and J. Rueger.

Graham Ave., No. 437, w s, 25' n Frost St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $3,000; owner, Julia Grice, 437 Graham Ave.; architects and carpenters, Sammis & Bedford; masons, Doyle & Brazill.

Thirty-second St., n e cor. Third Ave., three-st'y frame store and tenement, tin roof; cost, $4,000; owner, John Morrison, 283 Twenty-second St.; architect, Francis Ryan; builder, Daniel Ryan.

South First St., s s, 100' w Third St., three-st'y brick tenement, tin roof; cost, $4,000; owner, Wm. Baker, 128 South Fifth St.; architect, E. F. Gaylor; builders, Wm. L. Langridge and Marinus & Gill.

Bedford Ave., n e cor. Hancock St., four-st'y brick store and flat, tin roof; cost, $14,000; owner and builder, S. E. C. Russell, Hancock St., near Bedford Ave.; architect, I. D. Reynolds.

Washington Ave., w s, 150' n Park Ave., 2 three-st'y brick stables and feed stores, felt and gravel roofs; cost, $11,000; owners, Haviland & Shotwell, 16 Fulton St.; architect and builder, Eli Osborn.

Chicago.

BUILDING PERMITS. — J. & J. F. Gubbins, two-st'y store and dwell., 180 Colorado Ave.; cost, $3,000; architect, C. Palmer.

S. E. Gross & Co., 12 cottages, 1309-1331 Monroe St.; cost, $30,000; architect, L. H. Hallberg.

J. Biehl, two-st'y dwell., 678 West Superior St.; cost, $3,000.

S. E. Gross & Co., 13 cottages, 409-437 Gross Park Ave.; cost, $18,200; builder, S. E. Gross.

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H. G. Peters, 2 two-st'y flats, 501-503 Hermitage Ave.; cost, $7,000, architect, H. Bessler.

V. Harboro, four-st'y store and flats, 545 West Madison St.; cost, $12,000; architects, Wm. Strippelman & Co.; builder, J. Comen.

Mrs. E. Smith, five-st'y factory, 28-30 Desplaines St.; cost, $12,000; architect, J. M. Van Osdel.

Geo. Wilson, two-st'y dwells., 290-292 Belden Ave.; cost, $10,000; architect, J. Otto; builder, C. Lind.

Miss C. T. Kerrgan, two-st'y flats, 305 Loomis St.; cost, $3,700.

F. Sammis, two-st'y dwell., 327½-329 Twenty-fourth St.; cost, $4,500; architect, C. O. Hansen.

J. Schrever, two-st'y flats, 124 Nineteenth St., cost, $3,200; architects, Furst & Rudolph.

Cincinnati.

CINCINNATI'S IDLE WORKMEN. — A careful estimate of the number of the unemployed men in this city in the skilled trades gives a total of 16,700. The figures are those of the different workingmen's organizations and of the Board of Trade and Associated Charities.

Among the workers in iron, one-fourth of the men are idle; in the building trades one-third of the men usually employed are idle; and in carriage and furniture factories nearly one-half are idle. Not included in this estimate are nearly 2,000 cigar-makers and upward of 1,000 tailors and poor women who sew on tailors' goods and clothing at their homes.

Of common laborers there are, of course, a large number out of work, and if all these and the members of trades not requiring much skill were included, it is estimated that the total number of men out of employment would reach 30,000. — *New York Times.*

MASONIC TEMPLE. — The Ohio Consistory of Scottish Rite Masons have begun a subscription to raise a sum sufficient to restore the temple in this city.

BUILDING PERMITS. — Repair Masonic Temple; cost, $40,000.

J. Magly, two-st'y brick dwell., Mt. Auburn; cost, $3,000.

J. Hovekamp, three-and-one-half-st'y brick dwell., cor. Clinton and Baymiller Sts.

Itto Kramer, two-st'y brick dwell., cor. Euclid and Moliter Ave.; cost, $6,000.

F. Ewald, three-st'y brick dwell., cor. Richmond and Fillmore Sts.; cost, $6,000.

Jno. Baconhoff, three-st'y brick dwell., cor. Stone and Brum Sts.; cost, $5,000.

B. F. Mayburgh, three-st'y brick dwell., 142 Cutter St.; cost, $3,000.

Herwig, two-st'y brick dwell., 256 Betts St.; cost, $6,000.

Jno. Rendigs, two-st'y brick dwell., cor. Highland and Moliter Sts.; cost, $5,000.

J. Hoeffer, four-st'y brick dwell., cor. Liberty and Mansfield Sts.; cost, $5,000.

H. Wuest, four-st'y brick dwell.; cor. Race and Canal Sts.; cost, $7,000.

E. F. W. Frauzmier, three-st'y brick dwell., McMillan St.; cost, $2,500.

Wm. Dometto, three-st'y brick dwell., Court St.; cost, $3,700.

Josephine Sauer, four-st'y brick dwell., cor. Oak and McMiken Sts.; cost, $9,000.

M. Wiegand, three-st'y brick dwell., cor. Jackson and Twelfth Sts.; cost, $3,200.

Henry Elstro, four-st'y brick dwell., 151 Woodward St.; cost, $4,200.

Benj. Hey, two-st'y brick dwell., Broadway; cost, $6,000.

Repairs, $6,625.

Total cost to date, $121,225.

Total permits to date, 31.

New York.

BANK-BUILDING. — The Emigrant Industrial Savings Bank owns the house and lot No. 51 Chambers St. The old buildings will be torn down and on the site will be erected a substantial fire-proof building occupying the entire area of the two lots, 48 feet wide, and 150' deep, fronting on both Chambers and Reade Sts. The edifice will probably be of granite, and will cost about $550,000.

HOUSES. — On the s e cor. of Seventy-fourth and Seventy-fifth Sts. and West End Ave., 24 three-st'y and basement brown-stone and terra-cotta trimmed dwells., with 18' to 20' frontages, are to be built from designs of Messrs. Lamb & Rich.

INSTITUTIONS. — On the e s of Madison Ave., between Eighty-First and Eighty-second St., buildings for the House of Mercy are to be built from plans of L. J. O'Connor, at a cost of $120,000. It will have a frontage of 185' on Madison Ave. and 50' on the streets.

For the Methodist Episcopal Church Home of the Aged and Infirm, a building is to be erected on the e s of Tenth Ave., covering the block from Ninety-second to Ninety-third St. It is to be of brick with stone finish, four-st'y, and will be from designs of Messrs. D. & J. Jardine.

For the House of the Good Shepherd, a four-st'y brick, stone and terra-cotta building, to cost $30,000, is to be built on the s e cor. of Ninetieth St. and Avenue A; from plans of Mr. Laurence J. O'Connor.

MUNICIPAL BUILDING. — Acting under the suggestion of Recorder Smyth, the Grand Jury this week, before being discharged for the term, handed in a presentment setting forth the necessity for providing better accommodations for the various city departments, and recommending that the Legislature authorize the Commissioners of the Sinking Fund to select a site in the City-Hall Park, upon which to erect a building or buildings for municipal purposes. The City-Hall and New Court-House, however, must not be removed to make space for the proposed building. The Grand Jury in their presentment go over the same grounds as those touched upon by the Grand Jury of the May term in 1882, regarding the unsafe condition of the Hall of Records, and the necessity for more room for other departments.

PARISH SCHOOL-HOUSE. — A new school is to be built in Grove St.; bet. Bedford and Bleecker Sts., by the Catholic parish of St. Joseph. It will cover a lot 82' 7" in width, and 104' in depth, and will be four-st'y in height. The material to be used is brick, stone and terra-cotta.

BUILDING PERMITS. — *Canal St., No.* 272, four-st'y and basement brick store, tin roof; cost, $8,000; owners, D. & W. Heidgerd, 274 and 276 Canal St.; architect, Jno. B. Snook; builder, not contracted for.

One Hundred and Twenty-seventh St., s s, 184' w Third Ave., five-st'y brick and brown-stone apartment-house, tin roof; cost, $23,000; owner, Thos. W. Beacom; architect, C. Baxter.

East Eleventh St., Nos. 626-630, 3 five-st'y brick tenements, tin roofs; total cost, $48,000; owner, Fred. Heerlein, 932 Second Ave.; architect, J. Kastner.

West Thirty-eighth St., No. 321, four-st'y brick and brown-stone tenement, tin roof; owner, John D. Hassinger, 319 West Thirty-eighth St.; architects, A. Pfund & Son.

Madison Ave., n w cor. Eightieth St., four-st'y brick dwell., tin roof; cost, $15,000; owner, Miss Julia A. S. Kilpatrick, Sixty-ninth St., e of Eightieth St.; architects, D. & J. Jardine; builder, Edw. Kilpatrick.

Courtlandt Ave., n e cor. One Hundred and Fifty-seventh St., three-st'y frame tenement, tin roof; cost, $5,000; owner, Adolph Koeneman, Courtlandt Ave., cor. One Hundred and Sixty-second St.; architect, A. Arctander.

Eighth Ave., n w cor. One Hundred and Thirty-fourth St., 4 four-st'y brick stores and tenements, tin roofs; cost, each, $10,000; owner, L. Weiher, New Rochelle; architect, H. J. Dudley.

Eighth Ave., w s, 50' 11" s One Hundred and Twenty-third St., runs through to St. Nicholas Ave., three-st'y brick store and dwell., tin roof; cost, $10,000; owner, John M. Pinkney, 716 Madison Ave.; architect, J. H. Valentine.

Fifty-seventh St., n s, 225' w Ninth Ave., seven-st'y brick, terra-cotta and brown-stone tenement, tin

roof; cost, $60,000; owner, Ph. Braender, Ave. B, between Eighty-fourth and Eighty-fifth Sts.; architect, John Brandt.

One Hundred and Thirty-fourth St., s s, 150′ w Eighth Ave., 2 four-st'y brick tenements, tin roofs; cost, each, $14,000; owners and builders, E. K. Little & Co., 62 Pine St.; architect, Wm. D. Peck.

West Forty-seventh St., No. 527, five-st'y brick tenement, tin roof; cost, $15,000; owner, Robert Muhn, 784 Ninth Ave.; architect, C. F. Ridder, Jr.

West Forty seventh St., No. 529, five-st'y brick tenement, tin roof; cost, $15,000; owner, Philipp Dromeshauser, 535 West Fiftieth St.; architect, C. F. Ridder, Jr.

West Forty-seventh St., No. 531, five-st'y brick tenement, tin roof; cost, $9,500; owner, Henry Reinmuller, 533 West Forty-seventh St.; architect, C. F. Ridder, Jr.

Christopher St., No. 178, four-st'y brick tenement, tin roof; cost, $9,000; owner, Joseph Wille, 176 Christopher St.; architect, C. F. Ridder, Jr.

Courtlandt Ave., e s, 56′ s One Hundred and Sixty-second St., four-st'y frame tenement, tin roof; cost, $6,500; owner, John Hoffmann, 697 Eighth Ave.; architect, C. F. Ridder, Jr.; builder, F. Schwab.

Courtland Ave., e s, 81′ s One Hundred and Sixty-second St., four st'y frame tenement, tin roof; cost, $6,500; owner, Frank Schleininger, 331 West Thirty-eighth St.; architect, C. F. Ridder, Jr.; builder, F. Schwab.

Fletcher St., Nos. 20 *and* 22, four-st'y brick store, tin roof; cost, $8,000; owner, Malvina Keteltas, by E. M. Keteltas, trustee, 37 St. Mark's Pl.; architect, J. Sexton; builders, C. Callahan and H. D. Powers.

West Thirty-fourth St., Nos. 562, 564 *and* 566, four-st'y brick factory and lofts, tin roof; cost, $9,000; owner, Cornelius Daly, 268 West Thirty-fourth St.; architect, M. V. B. Ferdon; builders, Gillespie & Harlow.

Sixth Ave., s w cor. One Hundred and Thirty-third St., 8 three-st'y and basement brown-stone front dwells., tin and slate roofs; cost, total, $80,000; owner, H. Josephine Wilson, 325 East Fourteenth St.; architects, Cleverdon & Putzel.

Fordham Ave., e s, about 250′ s One Hundred and Eighty-fourth St., one-st'y brick church, slate roof; cost, $9,400; owner, Home for Incurables, on premises; architects, Renwick, Aspinwall & Russell; builders, Edward Gustaveson and Frank Lyons.

Mulberry St., No. 242, six-st'y brick tenement, tin roof; cost, $22,000; owner, Andrew C. Zabriskie, 12 East Thirtieth St.; architect, Jas. E. Ware.

Forty-second St., n s, 100′ w Eighth Ave., five-st'y brick and stone flat, tin roof; cost, $20,000; owner, Theresa Sigrist, 305 West Forty-second St.; architect, G. A. Schellenger.

Ninth Ave., s w cor. Fifty-sixth St., 4 six-st'y brick tenements, tin roofs; cost, total, $110,000; owner, Rosalie Steinhardt, Sixth Ave. and Fifty-seventh St.; architect, Geo. B. Pelham.

Madison St., No. 175, five-st'y brick tenement, tin roof; cost, $17,000; owner, Louis Stein, 174 Madison St.; architect, Chas. Rentz.

Tenth Ave., w s, 25′ s Forty-eighth St., four-st'y brick tenement, tin roof; cost, $13,000; owner, Mrs. Catharine Miller, 449 West Fiftieth St.; architects, A. Pfund & Son.

ALTERATIONS.—*College Pl., No.* 22, repair damage by fire; cost, $5,500; builder, Henry Wallace.

Gold St., No. 85, repair damage by fire; cost, $3,000; owner, Estate Wm. P. Miller, Wm. E. Howell, exr., 226 West Twenty-fourth St.; builder, Elward Smith.

New St., No. 46, four-st'y brick extension, tin roof; cost, $3,000; owner, E. B. Meeks, exr., 46 East Seventy-ninth St.; architect, Augustus Hatfield; builder, Hugh Getty.

West Thirty-sixth St., Nos. 333 *and* 335, repair damage by fire; cost, $6,000; owners, Messrs. Calenburg & Vaupel, on premises; architect, H. J. Dudley.

West Fourteenth St., No. 20, three-st'y brick extension, rebuild front and rear walls of main building, etc.; cost, $20,000; owner, W. Jennings Demorest, 15 East Fourteenth St.; architect, A. Craig; builder, not selected.

Fifth Ave., No. 242, one-st'y brick extension, tin roof, put in elevator and internal alterations; cost, $18,000; owner, Fred J. Slade, exr., Trenton, N. J.; architect, Geo. Ed. Harding.

Cedar St., No. 75, raise one st'y, put in passenger-elevator, and other internal alterations; cost, $50,000; owner, the National Bank of Commerce, on premises; architect, John W. Ritch.

Second Ave., Nos. 1607 *and* 1609, four-st'y brick extension, tin roof; cost, $4,000; owner, Patrick Sheehy, cor. Eighty-seventh St. and Lexington Ave.

Philadelphia.

BUILDING PERMITS. — *Chestnut St., Nos.* 1321 *and* 1323, 2 four-st'y back buildings, 20′ x 60′; Jno. Wanamaker, owner.

Eighteenth St., s of Christian St., three-st'y dwell., 17′ x 64′; W. Marshall, owner.

North St., No. 524, two-st'y stable, 16′ x 72′; W. R. Dougherty, contractor.

South Front St., No. 310, three-st'y store, 15′ x 45′; W. D. Jacoby, contractor.

Vienna St., No. 1326, three-st'y dwell., 18′ x 30′; Jas. McCauley & Sons, contractors.

South Twentieth St., No. 912, three-st'y dwell., 16′ x 67′; Jno. G. Hacks, contractor.

East Montgomery Ave., No. 1320, two-st'y dwell., 16′ x 26′; Wm. J. McDevitt, owner.

Filbert St., No. 922, two-st'y back building, 16′ x 38′; Henry Taylor, contractor.

St. Louis.

BUILDING PERMITS. — Thirty-nine permits have been issued since our last report, twelve of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —

J. Swaterk, two st'y double brick dwell.; cost, $3,500; Hermann & Schumacher, contractors.

Adolphus Busch, one st'y brick private stable; cost, $15,000; E. Jungenfeld & Co., architects; contract sublet.

H. W. Peters, 3 adjacent two-st'y dwells.; cost, $6,000; M. Dunn, contractor.

Anheuser Busch Brewery Co., seven-st'y brick malt-house; cost, $50,000; E. Jungenfeld & Co., architects; contract sublet.

E. Archard, two-st'y brick dwell.; cost, $2,500; T. F. Marley, contractor.

Fred. Kunst, 2 adjacent two-st'y dwells.; cost, $3,500; Aug. Stade, contractor

Peter Kubrich, two-st'y brick dwell.; cost, $2,500; Thos. Knittel, contractor.

Jos. H. Kelly, 3 adjacent two-st'y dwells.; cost, $4,200; contract sublet.

Henry Belter, two-st'y store and dwell.; cost, $3,300; Wm. Damon, contractor.

J. J. Steffen, 4 adjacent two-st'y tenements; cost, $7,000; J. J. Steffen, contractor.

A. Wackmann, 3 adjacent two-st'y dwells.; cost, $9,000; A. Beinke & Co., architects; Beckemeier & Riekmann, contractors.

Henry Debus, 2 adjacent two-st'y stores and tenements; cost, $5,000; Beckemeier & Riekmann, contractors.

F. Sebastian, two-st'y double tenement; cost, $3,800; P. Sauerwein, contractor.

General Notes.

CHARLESTON, S. C. — The City Assessor, Capt. W. Aiken Kelly, furnishes the following summary of permits issued during the month of February for the erection of new and the improvement of old buildings: —

New buildings, 17 permits; reported cost, $5,850.

Old buildings improved, 10 permits; reported cost, $7,350.

Total permits for February, 27; reported cost, $13,200.

Henry Olinn is building a two-st'y brick store for J. C. Hess, cor. Meeting and Horlbrech Sts.; cost, $13,500.

W. F. Carter has closed a contract with A. Sydney Smith, to build a two-and-one-half-st'y frame residence, cor. Montague and Rutledge Sts., to cost $8,700; first pile to be driven on Inauguration Day.

Bids and Contracts.

CINCINNATI, O. — The following is an abstract of the bids for the carpenter and joiner work by the board of trustees to rebuild the court-house, Hamilton County, O.: —

H. E. Holtzinger, $46,336.
James Griffith & Sons, $35,980.
Henry Behrens, $45,265.
Robert Thoms, $38,900.
G. F. Neiber, $39,476,
J. W. Cotteral & Co., $28,937.50 (*accepted*).
Harwood & Son, $40,628.
James Gurren & Co., $50,000.

TERRE HAUTE, IND.—The following is a synopsis of the bids for iron beams required for the court-house, etc.: —

Dearborn Foundry Co., 1525 Dearborn St., Chicago, Ill., $1,024.61 and $1,190; bid of $1,190 reduced ½ cent per pound on account of decline in market (*accepted*).

Carnegie Bros., Pittsburgh, Pa., $1,036.11 and $1,201.94; bid of $1,201.95 reduced ½ cent per pound on account of decline in market.

N. J. Steel and Iron Co., 17 Burling Slip, New York, $1,207.71

Phœnix Iron Co., Trenton, N. J., $1,218.77.

L. M. Morris, Pittsburgh, Pa., $1,282.06.

Eagle Iron Works, Terre Haute, Ind., $1,126.21.

Phœnix Foundry and Machine Co., Terre Haute, Ind., $1,150.

COMPETITION.

CITY-HALL.

[At Richmond, Va.]
February 16, 1885.

Proposals are invited **until June 1st, 1885**, for furnishing designs for a city-hall upon which premiums will be paid as follows: —

For first best design, $700.

For second best design, $300.

The Committee on Grounds and Buildings of the City Council reserves the right to reject any and all designs.

For information address the undersigned.

487 W. E. CUTSHAW, City Engineer.

LADIES' COLLEGE.

[At Montreal, Can.]
22 ST. JOHN STREET,
MONTREAL, February 20, 1885.

The Trustees of the Trafalgar Institute, being desirous of erecting a building for the purposes of a ladies' college, invite architects to submit plans and estimates for the same.

Full particulars as to site, etc., can be had by applying to the undersigned.

Plans, etc., to be submitted **not later than 1st of April next.**

ALEX. F. RIDDELL,
481 Secretary Trafalgar Institute.

PROPOSALS.

ELEVATORS.

[At Kansas City, Mo., Memphis, Tenn., and Montgomery, Ala.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., March 3, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 31st day of March, 1885**, for furnishing and erecting complete, a steam passenger elevator in the new public buildings in each of the *above-named cities*, in accordance with drawings and specification, copies of which and any additional information may be had at this office or the office of the superintendent at each building.

Bids must be accompanied by a certified check for $1,000, drawn to the order of the "Secretary of the Treasury," as a guaranty that the bidder will enter into a contract if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received *after* the time of opening will *not* be considered.

M. E. BELL,
481 Supervising Architect.

PROPOSALS.

PAINTING, POLISHING AND GLAZING.

[At Memphis, Tenn.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., February 28, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 27th day of March, 1885**, for all the painting, polishing and glazing required for the custom-house, etc., building at Memphis, Tenn., in accordance with specification, copies of which and any additional information may be had on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check for $500, drawn to the order of the Secretary of the Treasury, as a guarantee that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered.

M. E. BELL,
481 Supervising Architect.

BOILER.

[At Quebec, Can.]

DEPARTMENT OF PUBLIC WORKS,
OTTAWA, February 19, 1885.

Sealed tenders, addressed to the undersigned, and endorsed "Tender for Boiler," will be received at this office **until Friday, the 13th day of March next, inclusively**, for the construction of and placing in position a new steel boiler, in the dredge "Canada," now lying in the Louise Basin, Quebec Harbor, according to a plan and specification to be seen at this office, at the Harbor Engineer's office, Dalhousie St., Quebec, and at the office of the Superintendent of Dredging, Public Works Office, Custom-House Building, St. John, N. B., where printed forms of tender can be obtained.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied and signed with their actual signatures.

Each tender must be accompanied by an accepted bank check, made payable to the order of the Honorable the Minister of Public Works, equal to five per cent of the amount of the tender, which will be forfeited if the party decline to enter into a contract when called on to do so, or if he fail to complete the work contracted for. If the tender be not accepted, the check will be returned.

The Department will not be bound to accept the lowest or any tender.

By order, A. GOBEIL,
480 Secretary.

ELEVATORS.

[At Cincinnati, O.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., February 28, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 28th day of March, 1885**, for furnishing and erecting complete, in the custom-house and post-office building at Cincinnati, O., two hydraulic passenger-elevators, two mail-elevators, and one ash-lift, in accordance with drawings and specification, copies of which and any additional information may be had on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check for $1,000, drawn to the order of the Secretary of the Treasury, as a guarantee that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered.

M. E. BELL.
481 Supervising Architect.

EXCAVATING, CONCRETE FOUNDATIONS, BRICKWORK, ETC.

[At Shreveport, La.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., February 25, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 11th day of April, 1885**, for furnishing all labor and material required for the excavating, the concrete foundations, and the brick and stone work of basement and superstructure of the post-office, court-house, etc., building at Shreveport, La., in accordance with the drawings and specification, copies of which may be seen and any additional information obtained at this office or the office of the superintendent.

Bids must be accompanied by a certified check for $1,000, drawn to the order of the Secretary of the Treasury, as a guarantee that the bidder will enter into a contract if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered.

M. E. BELL,
481 Supervising Architect.

CITY-HALL.

[At Grand Rapids, Mich.]

The Board of Public Works, of Grand Rapids, Mich., invite sealed proposals **until March 19, 1885, at 7 o'clock, P. M.**, for furnishing the entire material and labor for building a city-hall. Drawings, specifications and instructions to bidders, together with printed forms and schedules, can be seen at the office of said Board. Each bidder shall deposit with his proposal a certified check (payable to the order of the undersigned) for one thousand dollars to be forfeited to the City of Grand Rapids, in case he shall fail to execute a contract and bond satisfactory to the Board, should his proposal be accepted.

The Board reserve the right to reject any or all bids.

The building is to be a *first-class fire-proof structure*, in size about 100′ x 160′; the exterior to be of rock-faced stone backed with brick,

GEO. W. THAYER,
480 President of Board of Public Works.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS.

WE ask our readers to read once more the following extract from a correspondent's letter on competitions published in our issue for February 21, and then to turn to what other correspondents say in commendation of his scheme in another part of this issue: —

"The public is as human as anybody who is not in search of a design, and it resents any attempt to coerce it, particularly in matters of taste. Hitherto all attempts at effecting a better routine have been coercive in their nature, and it occurs to me that a change is more likely to be effected by persuasive measures than by steps compulsory. The only suggestion I can offer is one which would require much self-devotion to carry out,— but there may be something in it.

"Suppose an invitation containing the usual restrictive clauses and insulting stipulations which debar self-respecting architects from touching the thing to be issued to-morrow. The chances are good that the party signing the call would receive from a dozen 'well-known' architects remonstrances, homilies and essays pointing out the monstrosity of his presumption. Now instead of this, suppose a dozen or more well-known architects should band together and write to the offending party, saying, 'Dear sir, we, who are severally the architects of the following well-known structures, cannot take part in your competition under its present unprofessional conditions; but if you will modify them so that they shall read thus and so, we will all then take part, and do our best work for you to choose from. Consider whether it is not for your advantage to select from the work of twelve men like ourselves — to say nothing of all the others — than to have us and all like us, of attested ability, refrain from aiding you.' This is Quixotic, no doubt, but it would unquestionably be effective, and would not need to be continued many times. The public knows a good thing when it sees it, and just so soon as it is proved that their way is not the best for them, they will abandon it.

"There is of course no chance of such a scheme being carried out if it is to be left to the unsupported philanthropy of a few individuals, but if the profession at large will take it up and support these dozen or more 'well-known architects,' by each contributing a dollar or so, a fund could be easily raised each time which should, when divided among the twelve or more champions of reform, fairly reimburse them for the outlay of thought and time expended for the common good of professional advancement."

Next, we ask our readers to assist us in making the experiment on the lines indicated, as we believe it is worthy of a serious trial, and we invite the cordial and *immediate* co-operation of every architect in the country, and urge each reader, as he reaches the end of this paragraph, to write to assure us: —

First, that he will not take part in the competition for the Richmond City-Hall on the terms already announced.

Second, that if selected to be one of the ten "champions of reform," he will submit in competition for this building — the programme being acceptably reconstructed — a design worthy of execution, and his own high fame.

Third, that, being unsuccessful in winning the grand prize — the erection of the building — or one of the cash prizes offered by the Richmond authorities, he will consent to share with the other champions the fund which we propose to endeavor to raise for their partial remuneration; the balance they must accept in glory, and those milder emotions which in this life reward the self-sacrificing.

WE trust that each architect who gives adhesion to this scheme will help to assure its success by sending at the same time, one, two or more dollars to be held in trust by us till the competition is decided, and the entire fund to be divided equally between those of the ten champions who have not won one of the city's prizes. We feel that for such a purpose and in such a way it should not be difficult to raise a fund of two thousand dollars or more. To test such a scheme some one must put himself forward, and the modest part we propose to play is to collect and subsequently divide the fund; to select — with the best advice we can procure — the ten champions; to explain the workings of the scheme to the authorities at Richmond, and if possible, cause them to issue a new and acceptable programme, and in general to do all in our power to assure that the experiment shall have a fair trial. It is a necessity of the case that all this must be done at the same time — it would be too late to raise the fund after we had brought about a new programme, and *vice versa* — and as failure from one cause or another is possible it is only proper to assure contributors that in such case we will return to each the amount contributed, less postage — we are obliged to make that slight reservation, for in a case of this sort we have no right to employ our publishers' money.

TO many of us how familiar "On to Richmond" war-cry, but in what a different sense can it be used in this case where the mission of the invaders is not to destroy, but to beautify. We have selected the Richmond competition, not because the terms of the present programme are markedly worse than those of many another, but simply because it is the most promising opportunity that now offers for designing a noteworthy building, and because we believe the Richmond authorities are really striving to secure a good building. Another reason is that it offers to the Southern architect a chance of designing a building in what he once may have considered his political Mecca, while to the Northerner it suggests another opportunity of showing how thoroughly he is desirous of obliterating, be it in never so slight a particular, the relic and remembrance of that older time when our adopted war-cry was first used.

THE fashion of professional association, so happily set by the recent Convention at Chicago, is rapidly spreading among the Western architects; and a call has just been issued for a meeting of the architects of the State of Missouri, for the purpose of forming a State Association, which will be affiliated with the Western Association of Architects. The meeting is to be held at the rooms of the St. Louis Institute of Architects, in the Public School Library Building, in the City of St. Louis, March 27, next. The call is signed by eleven of the best-known architects in the State, and it is much to be hoped that the response will be general. One reason for hastening the movement in Missouri at this moment is that the next Convention of the Western Association of Architects is intended to be held in St. Louis next November, and it is particularly desirable that a well-organized local society should be ready to receive it. It is worth noticing that the Western States have been the first to earn the gratitude of the whole profession by initiating the formation of State Societies, as distinguished from the city and town associations. To our mind, the State organizations are likely in the future to exert a stronger and better influence than any of the larger or smaller ones. Occupying, as they do, the middle place between the local societies, whose action on points of professional importance is necessarily influenced to a great extent by personal and temporary considerations, and the national, or semi-national bodies, which meet but once a year, and can attend only to matters of very general interest, the State societies are most advantageously situated, both for regulating professional conduct, which they possess just the personal knowledge, and the impersonal character, for doing well; and for defending professional interests, in cases of competitions or the like, in which they can interfere freely, and with authority, where local organizations, composed of a few members, can rarely venture to take a decided position.

THE principal thing to be feared for the State associations is that the members will lose their interest in their work, through lack of opportunities for meeting and discussing what they have to do; and we trust that the officers of those already formed, as well as of the others which will, we hope, be formed in rapid succession hereafter, will pay particular attention to this point. It is practically impossible, even in a country where travelling is so general as in our West, to obtain at short intervals anything like a general representation of the members of a society covering a whole State; and yet some sort of general participation in all the proceedings of the society is necessary not only to its influence, but to its continued existence. To find means for maintaining frequent communication among the members of such a society, without requiring too often their personal attendance at meetings, is a matter which depends mainly on the President and Secretary. Particularly is it desirable that the latter should, by the fulness and discrimination of his reports of meetings, and the punctuality with which they are forwarded to members, keep these informed of what goes on in their society, and, if possible, secure their participation, by correspondence, if not by actual presence. Among some of the professional societies abroad the vote of each member is taken on all questions of interest to the society by correspondence, a short printed statement of the proposed measure being forwarded to each by mail, with a coupon for his vote, to be detached and returned in the same manner. If the long-promised return-postal cards ever come really into use here, they will furnish an excellent means for conducting the proceedings of societies in this way, one-half of the card describing the matter under discussion, and the other having the Secretary's address printed on the face, leaving the back blank, so that the member may write his vote or opinion with the least possible trouble, and drop the card in the nearest mailing box.

A BAND-SAW for cutting marble is described in *Le Génie Civil*, which certainly merits mention. Every one knows that the saws ordinarily used for cutting marble or hard stone, which consist of plain steel blades, fed with sand, lose much of their efficiency by the filling of the cut with a paste of finely ground sand and stone, so that there is a certain advantage in working with a vertical saw, which does not accumulate pulverized stone beneath it. The difficulty in employing a toothed saw-blade lies, however, in the rapid wearing of the teeth, by which the blade is soon reduced to a smooth ribbon of steel. To prevent this, the new saw is provided with an accessory in the shape of a grooved wheel of hardened steel, which is set at right angles with the saw-blade, and engages with the teeth of the saw. This grooved wheel is made to press so firmly against the blade as to notch it, thereby reviving the teeth as fast as they are worn down. The teeth are of course rather rudely formed, and are left with a large "burr," but this seems to help the cutting action, by making more room for the blade in the cut. In practice this saw is operated at a very high velocity; and although we have no statement of its efficiency, it seems quite possible that it will be useful.

A GOOD deal of curiosity has been excited by the project for adding interest to the Paris Exposition of 1889 by the erection of a tower a thousand feet high. Perhaps the idea was suggested by the completion of the Washington Monument, now the highest building in the world, but, as a high tower is a very common ornament of fair grounds and seaside resorts, the Parisians may have had nothing more in mind than to raise a lookout tower suited to the magnitude of their present enterprise. The first essay at designing the thousand-foot structure was made by M. Eiffel, a distinguished engineer and contractor, the designer of the famous bridges over the Douro in Portugal and the Theiss at Szegedin, besides several other viaducts and engineering structures. M. Eiffel's tower, illustrated in our issue of two weeks ago, is intended to be all of iron and to contain several stories of large glass-roofed rooms to be used for various purposes. In emulation of his example, M. Bourdais, the architect of the Palace of the Trocadéro, has now prepared a plan for a tower of the same height, but designed to be built of what he calls "good old stone," in distinction from perishable metal. It cannot be denied that M. Eiffel's iron lookout has an air not altogether architectural, and M. Bourdais's design will probably prove to be much more monumental, but the advantage in point of stability may be with the former. M. Bourdais's plan, however, would be less costly in execution than the other. Leaving out of account the expense of the land, he estimates the cost of the stone tower, which would contain fourteen thousand cubic metres of granite, at five hundred and sixty thousand dollars; while the iron tower is estimated at six hundred and eighty thousand. If the cost of the land covered by the structure is included, the iron tower would be much the more expensive of the two, as its spreading base would occupy two acres and a half, or more than two million dollars' worth of land, at the present prices of land in the region of the Champs Elysées, while the granite monument need take only thirty-two hundred square feet, worth, at the same rate, about sixty thousand dollars. As M. Bourdais's tower is so small in horizontal section, there can be no great halls in it; but the rooms in the lower stories may be utilized for some purpose in connection with the Exhibition, and the upper floors will give space for eighty rooms, to be rented to invalids who need "air-treatment." The top is intended to be devoted to a huge electric lamp, having a power equal to two million argand gas-burners, which will, it is thought, give ample light for reading six or eight miles away, and will illuminate the streets of the city in a very effective manner. The inner portion of the tower is to be left unoccupied, forming an uninterrupted shaft a thousand feet high from the ground; and a well a thousand feet deep is to be sunk beneath it, so as to give a vertical shaft two thousand feet from top to bottom. This, it is supposed, will be useful for certain scientific experiments.

THE scheme for making a tunnel under the East River, from New York to the Long Island Shore, has advanced another step, and a company has been incorporated under the name of the "East River Tunnel Railroad Company," with a nominal capital of two million dollars, for carrying it out. The total length of the proposed tunnel is about thirty-five hundred feet, more than half of which is included in the shore ends and the portion under Blackwell's Island, which lies about in the middle of the route. By sinking shafts on each side of the island, as well as at the shore ends, the tunnel can be carried on from eight headings at once, and a great deal of time saved; while the four shafts, nearly at equal intervals, will serve to ventilate the excavation. Although the formation through which the tunnel must pass is entirely composed of gneiss rock, the cost of the work is estimated at one-fifth that of such a bridge as has been proposed for the same line, and the cost of maintenance will be much less than with a bridge. Whether the necessities of traffic between Long Island and New York are such as to require such a tunnel, in addition to the present suspension bridge, may be doubted, particularly in view of the fact that the infinitely greater traffic between New York and the New Jersey shore, which possesses now not even the convenience of a bridge, has not seemed to capitalists to warrant the completion of the tunnel already almost half built under the Hudson River; but that is a matter for the stock-holders in the new company to decide.

THE *Sanitary World* relates that the Midland Railway Company, about as matter-of-fact and unsentimental a corporation as exists in the world, recently employed a wizard, or diviner, or whatever he may be called, to point out, by means of a hazel twig, the proper spots for sinking wells to obtain water for their wagon-building establishment near Peterborough. There was a well on their ground, but it yielded only half the quantity required, and two more wells were sunk, without supernatural assistance, which yielded no water at all. Rather than go to the expense of bringing water a long distance in pipes, the company resolved to secure the services of a resident magician, and he was brought to the ground, with his forked witch-hazel twig. His mode of using this instrument, as described in the account, was the same as that followed here. Holding the twig in both hands by the forked portion, he walked about the grounds for some time, until at last the twig was observed to bend slowly downward and point to the earth. Noting the spot thus indicated, the wizard continued his march, until he came to a place where the twig was suddenly attracted with such violence toward the earth that it broke in his hands. At this point, and also at the one first found, wells were then sunk, and an inexhaustible supply of water found. The account goes on to suggest that the services of a person so supernaturally gifted might be of great importance in the African deserts, where, although the ground water-line seems to be at no great distance from the surface, the visible springs are situated in some cases five or six days' journey apart.

STATUES AND MONUMENTS OF LONDON.[1] — V.



George Canning, Westminster Abbey. Chentry, Sculptor.

THE last group consists of single statues and busts. Chantrey, 1782–1842, was the first to abandon altogether the allegorical compositions, and to content himself with single figures. I have already alluded to his statues in the open air. In the Abbey we have numerous examples of his work — the statues of George Canning, of Sir John Malcolm, of James Watt the engineer, of Horner, and others. There is always merit about them, there is never anything to offend. The likenesses are good, there is dignity and good taste; but, on the other hand, there is an absence of the highest qualities, and a certain commonplace air amounting to insipidity. Compare his George Canning, one of his best, with the statue of Canning's great son, Earl Canning, by Foley, standing next to it in the North Transept; both are evidently likenesses, both have dignity, but there is a something in Foley's which makes all the difference between a work of genius and the work of a highly cultivated artist without the sacred fire.

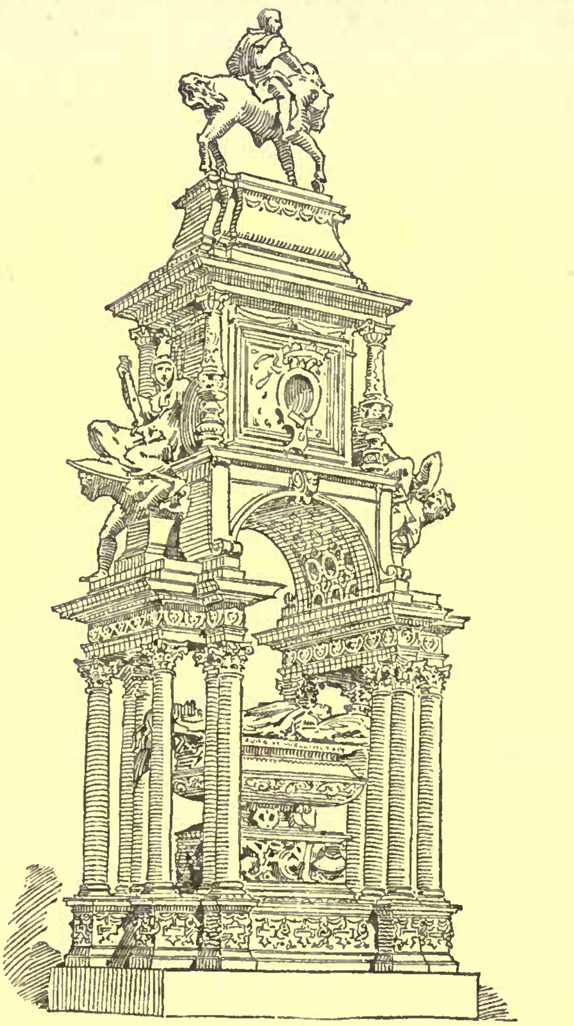
After Chantrey come Gibson, Foley and Stevens. The only statue by Gibson in the Abbey is that of Sir Robert Peel [see Illustrations], represented in a Roman costume, very inappropriate to the subject. The statue is anything but a success. It is said that Gibson refused to undertake the work unless he was permitted to represent the statesman in a toga. There is also the beautiful statue of the Queen by Gibson, with the figures of Justice and Mercy, in the Robing-Room behind the throne in the House of Lords.

Of Foley we have but a single work in the Abbey, the statue of Lord Canning already alluded to. In St. Stephen's Hall, the gallery leading to the central hall of the Houses of Parliament, there are the statues of Selden [see Illustrations] and Hampden by this artist, works of great merit. His best works, however, are at Dublin and Calcutta, and it is greatly to be regretted that Foley was not more in request for statues in London, for his work was of the highest order, uniting the rare quality of imagination with delicacy of treatment and purity of style. Of Stevens we have also a single work at St. Paul's, the magnificent monument of the Duke of Wellington, a recumbent figure with a lofty canopy, adorned with groups of allegorical figures. It is in the purest Italian style, and there has been nothing equal to it in this country since Torregiano. This closes the list of sculptors it is necessary to refer to without dealing with the works of living artists. It is not pretended that this short summary is either exhaustive or complete. There are many excellent works which have not been alluded to. There is, for instance, a noble bust of Sir T. Richardson, 1635, the jeering chief justice of Charles the First, by Hubert Le Sueur; there is the statue of Lady Walpole by Valori, 1737, suggested by the well-known figure of Modesty at Rome; there is the monument of Townsend, 1737, by Eckstein, 1757, representing a sarcophagus borne on backs of two Indians, a work of great beauty; there is the monument to the unfortunate Major André [see Illustrations]; an excellent statue of Wilberforce [see Illustrations] by Joseph; and many others could be mentioned. It has not been intended, however, to do more than suggest the succession of works which are to be found in the Abbey and St. Paul's.



James Watt, Westminster Abbey. Chantrey, Sculptor.

Of the monuments thus referred to in the Abbey, many are little seen, or are seen to great disadvantage owing to its crowded state. The most pleasing monument in the building, that of Vere, is hidden behind the gigantic monument of Wolfe, in the aisle of the North Transept, whose entrance from the aisle of the choir it completely blocks up; and the Vere monument itself shuts out from view to a great extent the monument to Sir George Holles, which is also one of the most interesting in the building. It would be the greatest improvement if the monument to Wolfe could be moved so as to open up the aisle and enable the Vere monument to be brought forward. This would at once improve the architectural effect of that part of the Abbey and bring into view both the Vere and Holles monuments. That of Wolfe is valuable from its associations, and should on no account be removed from the Abbey. Again, the intrusion of the gigantic monument to Watt, in the chapel of St. Paul's, among so many monuments of the Elizabethan era, and where it is so incongruous, is an outrage on good taste. The monument to Craggs, an extremely interesting one, is hidden away in a dark corner at the end of the nave, behind the colossal monument of Cornwallis. Many illustrations of the same kind could be given, where by judicious removals other monuments of great interest could be brought into the prominence they deserve. The fact is that the available space in the Abbey is too small for what already exists there, and it is certain that in the future monuments must either be reduced to the smallest busts, to be stuck up wherever a vacant corner can be found, and irrespective of their surroundings, as is now too often the case, or the demand for this national recognition must be refused altogether.



Monument to the Duke of Wellington, St. Paul's. Alfred Stevens, Sculptor.

On the other hand, it would be a most serious misfortune that a break should be made in the continuity of this splendid roll of monuments to the great and illustrious men of the Empire, or in the gallery of monumental sculpture, in which so far all that are eminent in that line of art have hitherto been represented. The subject is one which has long occupied the attention of those most interested in the Abbey. It was one in which Dean Stanley felt the deepest concern. He felt, as all have done who are cognizant of the facts, and who appreciate the Abbey in its various functions, that an effort must be made to extend its limits and to give greater space for monuments, if not for burials, in the future. Of the burials in the Abbey much might here be said. If it be advisable to continue them at all at Westminster, it is certainly most desirable that they should no longer be carried out within the Abbey proper, and that another and more fitting place should be found for them.

It is in this view that a proposal made by Sir Gilbert Scott found favor. I have already alluded to it in a former article on "London Improvements" in this Review.[2] The proposal of Scott was to build a cloister, or rather a monumental chapel, to the north-east of the Abbey, along the line of the houses in Old Palace Yard and Abingdon Street, and communicating by a covered passage passing under the buttresses of the Chapter House. The proposal would involve the demolition of all the houses in Old Palace Yard and in Abingdon Street as far as Great College Street, and the purchase of this property would cost about £200,000, a very large sum to expend in demolition.

For my own part I think that Scott's plan is open to some objection. The frontage of the chapel or cloister which he proposes would

[1] A paper by Mr. G. Shaw Lefevre, reprinted, with added illustrations, from the *Nineteenth Century*. Continued from page 101, No. 479.

[2] "London Improvements," *Nineteenth Century*, November, 1882.

extend eastward beyond the extreme end of the Chapel of Henry the Seventh, and the interesting old Jewel Tower, at the back of Old Palace Yard would again be hidden behind it. I incline to think that any addition to the Abbey in this quarter should not extend beyond the east end of Henry the Seventh's Chapel. This would bring it into a line with the Jewel Tower. A monumental chapel might be constructed in conformity with this view on the site of the houses on the east side of the Little Cloisters, and united to the Abbey in the manner proposed by Scott. This would involve the demolition of the houses in Old Palace Yard only, at a cost of about £80,000.

Supposing the chapel to cost about £50,000, the total sum required would be £130,000. Of this the main portion, it seems to me, should be subscribed by the public, if some wealthy benefactor could not be found to undertake it; and upon this condition, and speaking unofficially, I cannot but think there would be a strong claim for assistance to so great a cause, national, metropolitan and ecclesiastical, upon the three bodies who represent these interests, Parliament, the Metropolitan Board, or whatever body may represent the whole metropolis, and the Ecclesiastical Commission, in which body the estates of the Chapter of Westminster, now producing an immense revenue, are vested. It is then in a joint operation between the public, in its capacity of subscribers to a great and necessary and beautiful work, and the three bodies I have named, that the ultimate solution of this difficulty may be looked for.



C. J. Fox, St. Stephen's Hall, Westminster Palace.

Lastly, it is to be observed that such a plan, involving as it would the clearing away of the houses in Old Palace Yard and Poets' Corner, would be one of the most splendid improvements that could be carried out in this part of London. It would open out the south side of the Abbey, and disclose to view the beautiful Chapter House, now almost completely hidden. It is not many years since the north front of the Abbey, or a great part of it, was similarly hidden from view; old prints show that there was a row of buildings on either side of St. Margaret's Church, opposite to the old Law Courts, from Bridge Street to the Abbey. In fact the greater part of Parliament Square was covered with houses. These have all been demolished, and the Square has been completely cleared within the last thirty years. The Abbey now stands out in all its beauty on this side. The removal of the old Law Courts, and the opening to view of Westminster Hall, effected during the past year, has been another improvement of the same kind.

It is not too much to say that the panorama of buildings now seen from a point at the end of Great George Street, near to the statue of Peel, is one of the finest in Europe. On the extreme right stand the towers of the Abbey, then the whole range of its nave, transept, and Henry the Seventh's Chapel, against which St. Margaret's Church stands, not without advantage in breaking this long line, in supplying another tower, and in giving the means of appreciating the size of the Abbey. The Victoria Tower is then seen in full, down to its base, which was formerly scarcely visible from any point; then comes Westminster Hall, with its ancient buttresses, the contrast of whose simplicity and grandeur with the ornate frontage of the new palace, and with Henry the Seventh's Chapel, is very striking and not ungrateful to the eye. The picture ends on the extreme left with the graceful Clock Tower. What can be more beautiful or more full of interest than this range of buildings!

Parliament Square will be further improved when the street leading to it is widened uniformly with Whitehall, as is now proposed, and when a handsome block of buildings is erected along the new line with a frontage to the Square.

Little will then remain to be done in this quarter except to open out the view of the Abbey on its south side. The proposed monumental chapel, the Chapter House and the Abbey will then stand opposite to Barry's beautiful front of the House of Lords, and the Victoria Tower, and the "place" on this side of the Abbey will be not less striking than that on the other side.

When the wealthy people of London rise to a conception of the dignity and beauty of the great city in which they live, and from whence many of them derive their great incomes, and of their duties as citizens, so far better understood and acted upon in other great cities, it is certain that this improvement will be one of the first which will be accomplished. The Abbey, with its wealth of monuments, the Hall, and the Parliament House of Westminster will then form a group worthy of this, the *μεσόμφαλος* of the British Empire.

The World does Move. — The trustees of the British Museum have decided by a small majority in favor of Sunday opening.

THE DELLA ROBBIAS. — I.


"The Madonna a la Pomme." An enamelled Terra-Cotta by Luca Della Robbia.
(From *L'Art.*)

There are few sculptors whose names are more familiar to the popular ear than is Luca Della Robbia's. And the average tourist will tell you, I think, that the work of no artist whatsoever is better known to him; its individuality more clearly perceived, the effect it produced more distinctly recollected. Yet it is true none the less that there are few great artists to whom fuller justice has not been done. There are few who have been so carelessly studied, few whose best work is so ignored in favor of work that is less good, few whose reputation rests on such superficial grounds. Luca is popularly known, not in the essence of his art, but merely as the inventor of a novel, striking, and attractive technical process. Not the intrinsic character of his sculpture, but the fact that most of it is executed in enamelled colored terra-cotta is what the world at large remembers. I do not know whether to call him fortunate or unfortunate in this invention. Its results have a peculiar charm, and especially, a peculiar utility of their own. Their durability fitted them well for exterior architectural decoration, and to this they brought a note of clear pure color not otherwise to be obtained in combination with admirable form, and with the relief which gives admirable light and shade. And their polochromy fitted them no less for almost pictorially decorative uses within both church and palace. If we consider the legacy of the Della Robbia family as a whole, and remember what a unique, yet lavish and varied gift it was, we cannot regret that Luca left bronze and marble, and turned to clay instead.

But his own art suffered from the exchange. In any state clay is a less delightful material than the others. And when it is burned and enamelled, the very quality which makes it so useful and so tempting — the brilliant hardness of its surface — joins with the conditions of its making to put its results, considered as pure art below the results of bronze and marble. We see this very clearly when we contrast Luca's earlier works in these materials with even the best among his terra-cottas. Yet these are so much more "striking," so much more conspicuous in the sum of Renaissance sculpture, that the others are half-forgotten by the world in its estimating of his art. This would matter far less, however, were no terra-cottas called his, but those which are his own. But a peculiar confusion has been the result of peculiar circumstances. Luca was only one of many sculptors who made enamelled statues and reliefs; yet the process by which enamelled colors could be successfully applied to such broad and varied surfaces was for long a secret. For very many years it was exercised only in ateliers directed by men who bore Luca's name, who were inspired by his ideals, and whose results kept a strong family likeness to his own. All the other Della Robbias were his inferiors, yet even the connoisseur is often puzzled to decide what works are his and what are theirs, and the superficial eye can hardly understand that there is any difference between them. In Italy every enamelled terra-cotta is, popularly, a Della Robbia, and every Della Robbia is a Luca. Even when there is evidence to the contrary, no one cares to cite it. Who wants to remember, for example, that the famous *bambini* on the Hospital of the Innocents in Florence are children not of Luca but of Andrea? And how often have we not heard Luca named even in connection with the great frieze at Pistoja; a work which has absolutely no affinity with the subject-matter or with the spirit of his art?

It is always thus with artists who have forcibly impressed "a school;" but it is thus with Luca, I should say, much more conspicuously than with any other. For his school for long kept peculiarly close to his mood and manner, used a process not employed by others, and was not merely a school, but a *family* too. Had he employed only stone and bronze he would hardly have been so closely copied, or so long repeated. His popularity would have been diminished by the fact, and by the substitution of a usual for a strikingly unique

material. The world would not know his name any better than it knows the name of a still greater sculptor — of Donatello; would most probably not know it any better than that of Della Quercia or of Mina da Fiesole. But his work would all have been of his very best, and when his name *was* mentioned, it would always have been as that of a great sculptor, not, as too commonly to-day, though most unjustly even when his terra-cottas are in question, as that of a clever decorator, a skilful, pleasing artist of a kind below the best. A great sculptor he was indeed, few greater even in the race to which he belonged, the greatest race of sculptors that has lived since the Greek. We will not speak of Michael Angelo; there is no term of comparison between him and any other. But we may compare Luca with all the rest of Italy, and be rational in the act. He was not so noble as Ghiberti, for example, not so superb as Andrea Sansovino, not so strong as Donatello; but he is more charming, more lovable than either. Perhaps, too, he is not to be called as "original" as was Ghiberti in his idealism; as was Donatello in his realism; but he was extremely original in the way he combined these two qualities. In his exquisite poise between their two extremes — a poise which is not cold neutrality, but a vital hold on either side — he is as individual as any of his fellows. None has a more distinct personality, or a personality that would leave a much more deplorable blank were it absent from the marvellous company of Renaissance sculptors. Does the world which "knows" him so well quite realize all this? Has he not paid perhaps too great a price for his somewhat shallow popularity, and for the gratitude he gets as the Creator of a distinct *genre* in sculptured work?

Fortunately the critics are beginning to tell the world of what he was. In 1855, already, M. Barbet de Jouy wrote a good book about the family; and two years earlier, M. Delaborde, while considering specially the latest Della Robbias, in his "*Château de Bois de Boulogne*," had given an admirable introductory sketch of their great ancestor. In 1878, again, Herr Bode published a large volume of the studious German sort, entitled "*Die Kunstler Familie Della Robbia*."

But there was still great need of another work which should have a more popular interest, and should unite thorough historical research with keen artistic criticism. This work we have now in the shape of a fully illustrated quarto, "*Les Della Robbia*," written by M. Emile Molinier, one of the *conservateurs* of the Louvre collections, and M. J. Cavalucci, Professor in the Fine-Arts Academy at Florence. Previous studies have largely been put under contribution but many unedited documents have also been consulted, and some of them are reproduced in the appendix. Not the least merit of the volume is a long *catalogue raisonné*, wherein hundreds of works attributed to the family are clearly described, and so far as possible are attributed to their real creators. The many wood-cuts are not of such excellence as we in America should demand; but they are assisted by a few sympathetic etchings, and make up in number for what they lack in individual perfection. They give the reader a good idea, if not of the quality, at least of the general character of the art discussed. They will help him to know a Luca or an Andrea when he sees it, though they will not suggest a tithe of the beauty he will find in either.

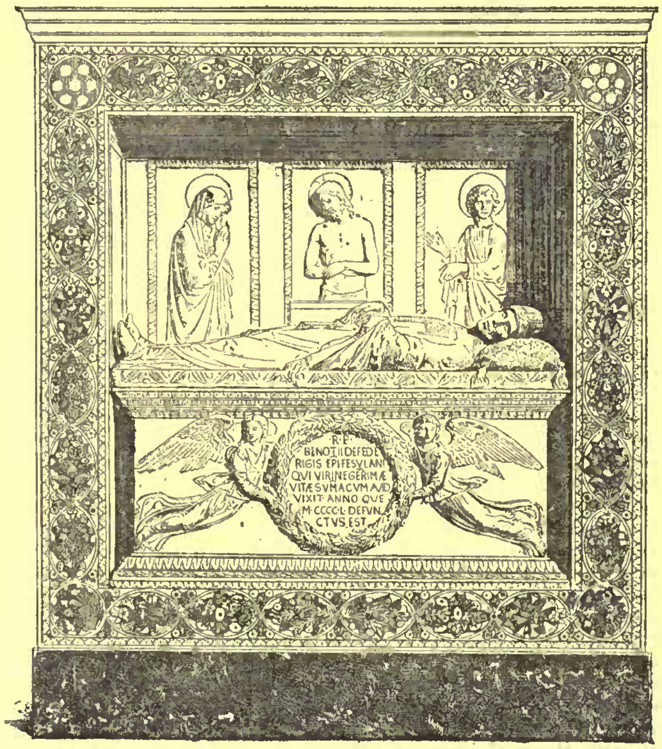
The way is long and varied from the first Della Robbia to the last. Between the organ-gallery in Florence, and the statue of Catherine de Medici in Paris there stretches almost a century and a half. I will try to tell the tale as briefly as I can. At first I wanted to make it a mere review of the book last named; but with a subject so suggestive and seductive one is loth to follow very closely even so good a guide. It will be my authority, however, in regard to facts of every kind.

Luca Della Robbia was born in Florence, as appears from an authentic document, some twelve years later than Vasari says, in 1399 or 1400. Like so many contemporary artists he was apprenticed to a goldsmith, but soon exchanged his craft for work in bronze and marble. And — again like so many others — his youthful industry seems to have been prodigious. Many of Vasari's anecdotes must be abandoned, and with them, perhaps, the statement of Baldinucci, that he studied with Ghiberti. His work certainly exhibits traces of Ghiberti's influence, but not more strongly than of Donatello's. It is probable that in his early years he travelled, but dates and destinations are alike uncertain. He never married, was intensely devoted to his art, and almost equally so to the education of his nephews, especially of Andrea who was to be the inheritor of his talent, the participator in his fame. One realizes the great contrasts of Renaissance life, when one compares, for instance, the story of Benvenuto Cellini with the story, if so it can be called, of Luca Della Robbia. Luca has indeed no history save the history of his work. Until his death in 1482, he led with his nephews in a little house on the Via Guelfa, a uniform, peaceful almost austere existence. As our authors say, his character is undoubtedly reflected very faithfully in the character of his art; and we may thence affirm that no man can have been more serene, more tender, more cheerful or more pure. In a very prosaic place, in his last testament, we find an almost poetic touch that helps to paint the household for us. It is well known that Andrea, as but natural, was his best-beloved. Yet to Simone, Andrea's brother, he leaves all his worldly goods, and to Andrea only, *he* does not say "only," his fame and the art which he had taught him. We must needs rank Andrea a space below his uncle as an artist; yet how rare a chance it was that such a fame should find so true a guardian, such an art so good a pupil. It was not in truth an art of his own that Andrea practised; it was the sequel of his uncle's merely. And, be it noted, if no one's work *but* Andrea's had been confounded with that of the great master, there would be far less to complain of than there is to-day.

Luca's reputation was very great with his contemporaries; Vasari tells this plainly, and it is still more plainly told by the fact that in 1471, he was obliged by his age and his infirmities to decline the greatest honor in the power of his fellow-craftsmen to bestow, the presidency of the Corporation of Florentine Artists.

He was thirty years old when Florence first gave him an important work to do, though he had doubtless already labored with a score of others on the exterior of the cathedral. This work, his masterpiece, I should say, considering execution and conception both, was a tribune for the organ in the cathedral. Its ten marble reliefs, representing chilren and symbolizing "Music" are now — together with a corresponding series, wrought by Donatello for the other tribune — in the Bargello Museum in Florence. We may regret on principle that they are not placed in their true position; yet we gain by the possibility of close inspection.

In 1447, these reliefs being still unfinished, Luca received another important commission, to complete the sculptures on the Campanile begun by Giotto and Andrea Pisano. Three years later both undertakings had been accomplished. A charming work, dating from 1442, is a tabernacle, built for the Chapel of St. Luke in the Hospital of Santa Maria Nuova, but now in the Church of Santa Maria at Peretola. It is a rich little architectural structure of marble with a *Pietà* in its pediment; but its frieze is ornamented with heads of cherubim wrought in white enamelled clay. A similar combination of materials—the enamel being in this case colored—is to be seen in the tomb of Benozzi Federhigi, Bishop of Fiesole, which also has



Tomb of Benozzo Federighi, Bishop of Fiesole, by Luca Della Robbia, in the Church of S. Francesco di Paola near Florence.

(From *L'Art.*)

been moved from its original station, has been taken from Fiesole to the Church of San Francesco di Paola near Bellosguardo. Sumptuous architectural sepulchres were among the most frequent works of the Renaissance. Many others have been attributed to Luca, but with regard to only one other can we be quite sure, and this, cited by Vasari, has unfortunately perished.

Among Luca's works in bronze the chief still survives, the door to the sacristy of the Florentine Cathedral which he began in collaboration with Michelozzo and Masaccio but completed by himself, after having had it in hand no less than thirty years.

Vasari tells us that Luca was discouraged at the slowness of his processes, and the consequent paucity of his rewards; that he perceived the greater facility with which clay might be fashioned, and set himself, therefore, to the discovery of some coating by means of which it might be made as durable as stone. (One is tempted to believe, rather, that it was the desire for *color* which prompted his investigations, or more exactly, the desire to *combine* color and durability). After many essays, Vasari adds, he did in truth "discover" an impervious enamel, and by its "invention" won great renown. From these words many have inferred that Luca was literally the first in Italy to use stanniferous enamel in any way, and thus the real parent of all the Italian majolicas. But a reference to the pages of Messrs. Molinier and Cavalucci, or indeed, of any one who has written the history of majolica, will reveal documentary evidence enough

to prove that enamelled faïence had long been known in the peninsula; probably for more than two centuries ere Luca worked with it. Nor was he by any means the first to use terra-cotta for architectural



"Tha Resurrection." An enamelled Terra-Cotta by Luca Della Robbia, in tha Tympanum of tha Door of the Sacristy of the Cathedral, Florence.

(From *L'Art.*)

decoration; nor again, to color statues; this had been done all through the Middle Ages, and in the ancient world as well. Yet he was a real discoverer and inventor in another way; in his *combination* of these different practices. He was the first to *apply color by means of enamel to sculpture in relief and this to monumental decoration.* Such is the sum of his originality, and I think it is great enough.

It is a common idea that at first Luca used only blue and white in his enamels. He always used them, of course, much more largely than any other colors; but from the very beginning seems to have introduced other tints in carrying out his details. We find, for example, green, violet and yellow in the tympanum representing the "Resurrection" which he placed in 1443 above the entrance for which his bronze door was wrought. And this is his earliest *dated* work, though probably not his first attempt since the new and difficult technical process is already perfect. Next among dated examples comes the corresponding tympanum over the other door of the sacristy, which represents the "Ascension." Here again we find all the colors I have named, and brown besides. We find them all, no less, in the cupola of the chapel of the Pazzi family in Santa Croce, which is evidently one of his earlier works, and certainly one of his finest essays in decoration.

Another common belief that Luca very often used white enamel without any color; is also questioned by our authors, who think that it was very exceptional for him to omit color, and attribute almost all the many existing white "Della Robbias" to a time as late as the sixteenth century; to the weakest period of the school.

Vasari speaks of two beautiful nude angels of gilded bronze, which Luca wrought "in the round," and placed above his organ-gallery in the cathedral; but they have disappeared, and the only detached figures we know of his are terra-cottas, the two kneeling angels with candelabra in the sacristy. They are far superior to the many analogous statues produced by his successors, yet they do not take their place among the very best of his creations.

Two of Luca's beautiful medallions on the outside of 'Or San Michele in Florence — the two which represent armorial bearings — are not in relief, are merely colored flat, and are therefore properly to be called majolicas. Similar works have been attributed to him in great numbers, but the authenticity of almost all is very doubtful. Conspicuous among them are the twelve large circular plaques, which the authorities of the South Kensington Museum believe were part of the ceiling of a room in the Medici Palace. Such a room, we know, was decorated throughout by Luca, even to its flooring; and in the work he used enamels both flat and in relief. But, as our authors say, there is no evidence, either internal or external, to prove that these illustrations of the "months" were ever part of it. And I may add that their beauty is not so very great that we need wish to insist on Luca's authorship.

Certain terra-cottas that are *not* enamelled and that yet apparently



"The Ascension." An enamelled Terre-Cotta by Luca Della Robbia, in the Tympanum of a Door of the Sacristy of the Cathedral, Florenca.

(From *L'Art.*)

are Luca's were, most likely, studies or models for his other works. There is one in the Berlin Museum for instance, which must have served in the execution of his bronze door.

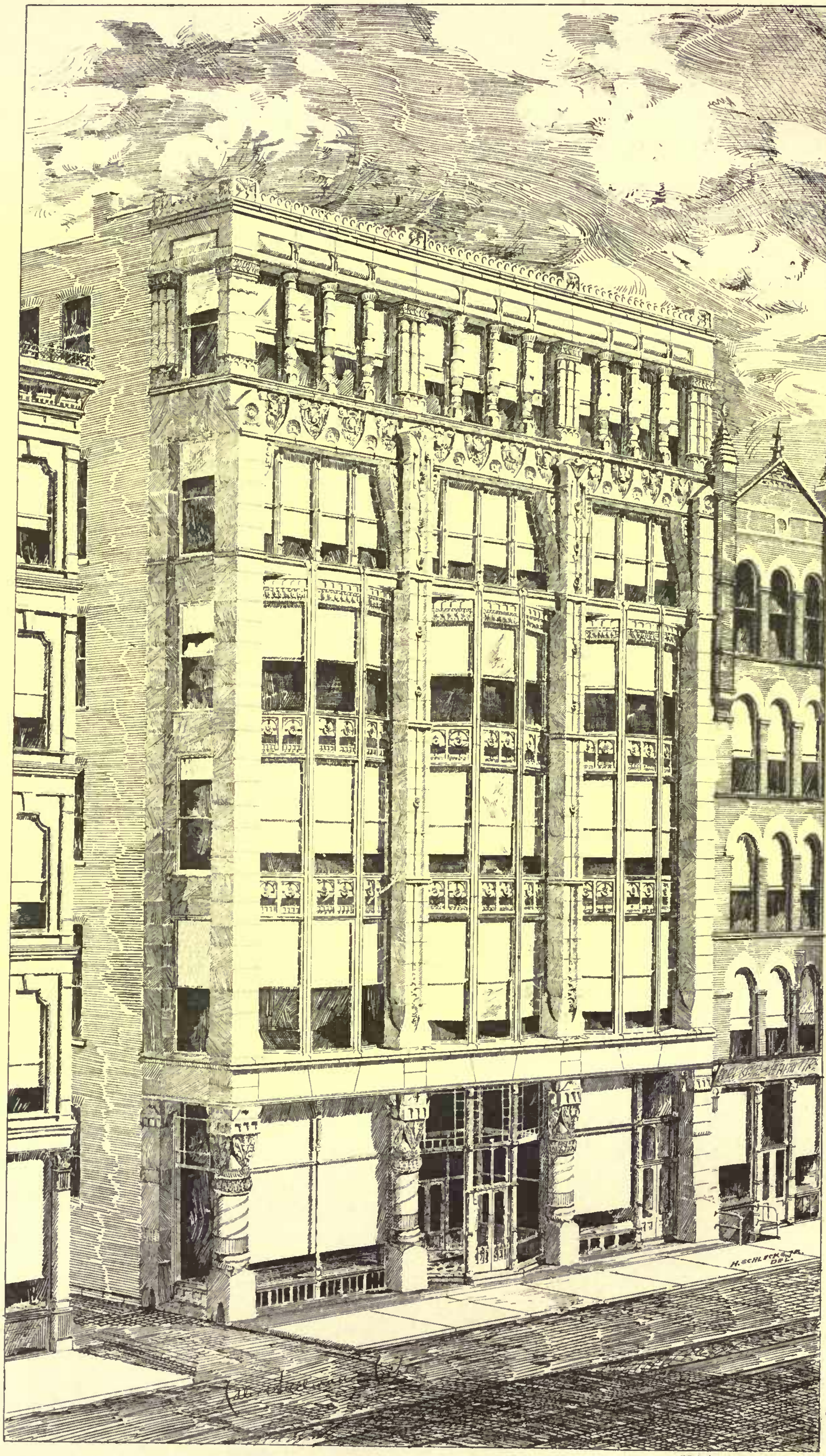
I cannot here repeat even the short list of terra-cottas, which may with certainty or with good likelihood be given Luca's name — I can only cite one or two of the most important. One of his finest tympana crowns a door on the Via dell' Agnolo in Florence, and shows the Virgin and child between lily-bearing angels. Very remarkable, too, and in a very different way — is the vault of the Chapel of the



Plaque in the South Kensington Musaum attributed to Luca Della Robbia.

(From *L'Art.*)

Cardinal of Portugal in San Miniato. It is entirely faced with colored enamels, a checquered surface of yellow, green and black, forming the background for five great blue and white medallions in relief. The central one bears the Holy Dove surrounded by gilded rays; the rest, half-figures of young angels symbolic of the cardinal virtues. These last reveal perhaps a stronger idealism than any of Luca's



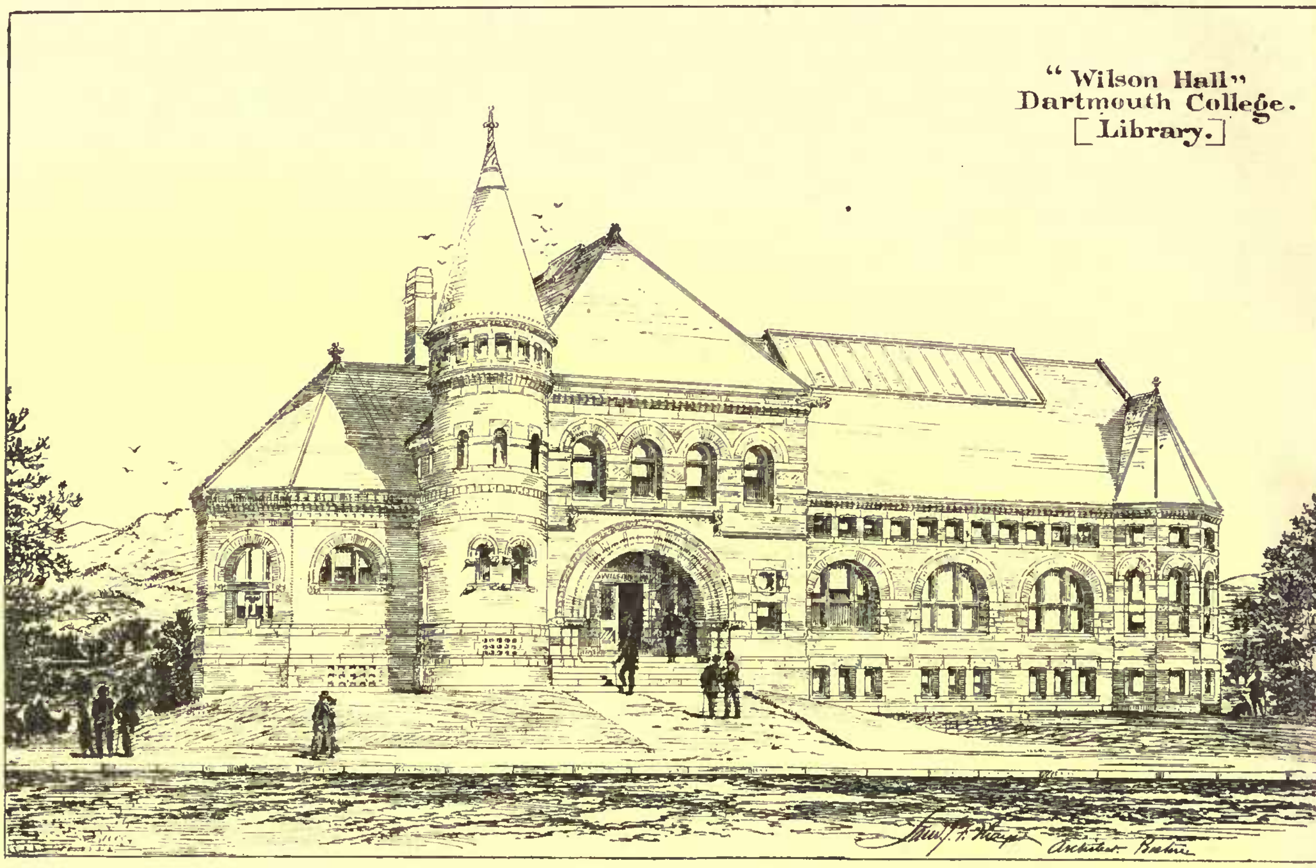
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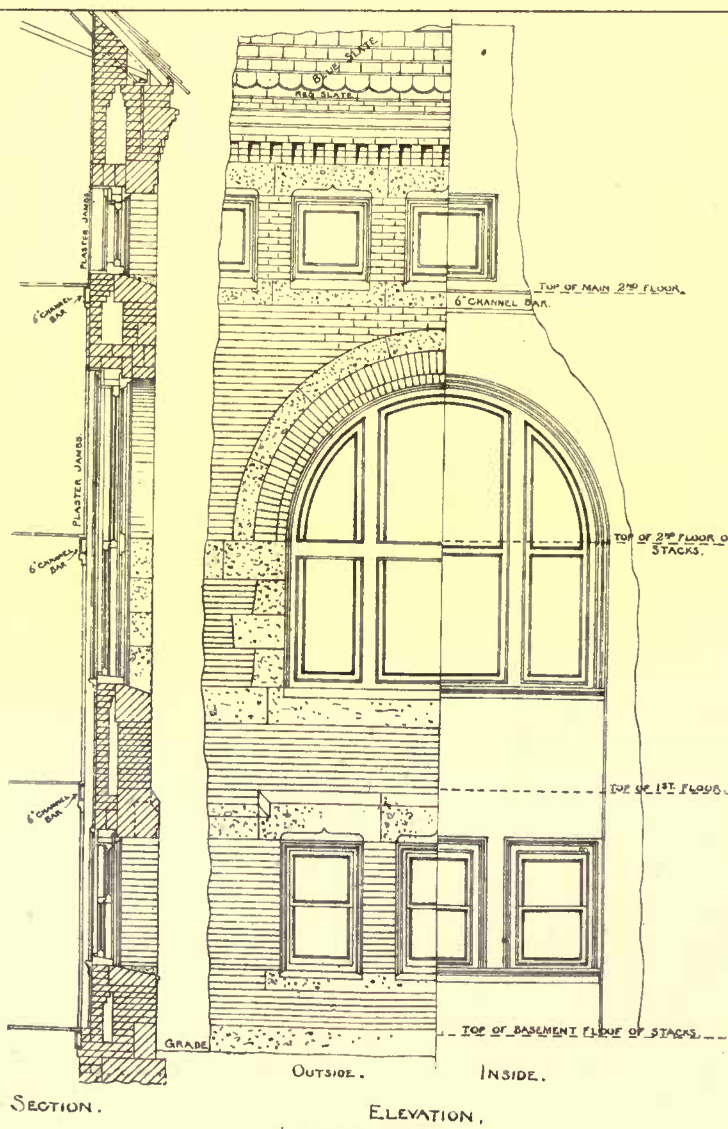
National Bank, Antwerp, Belgium.–1884.

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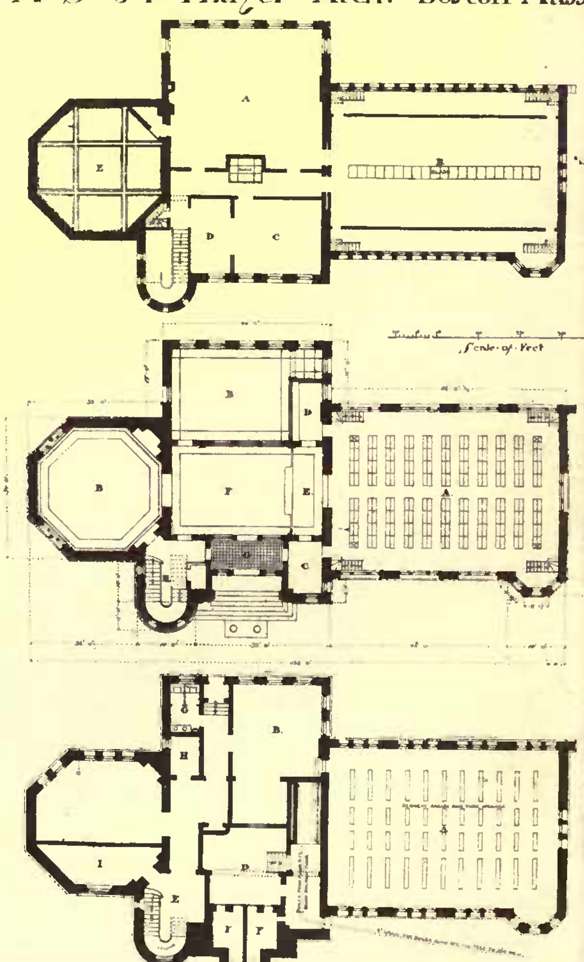
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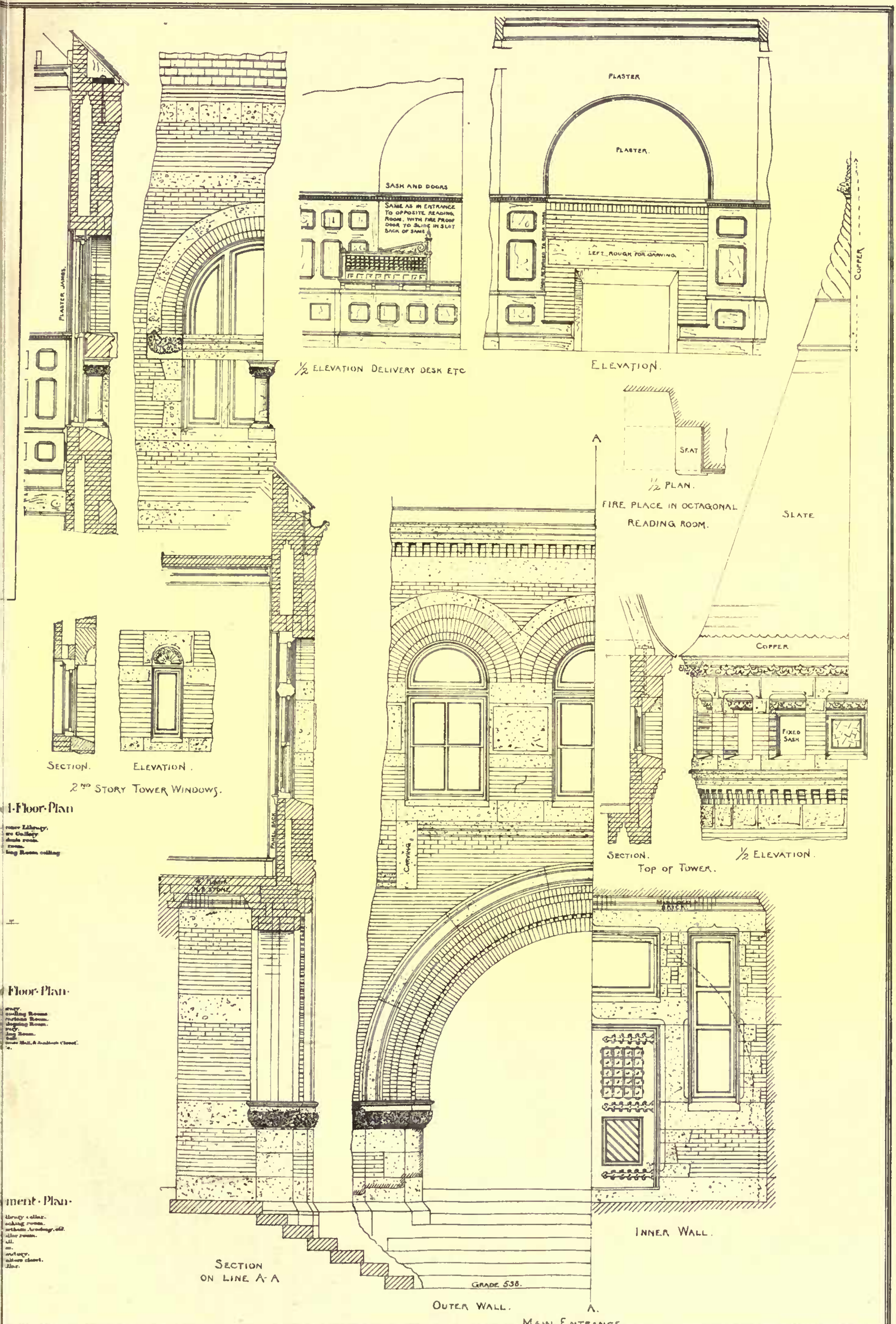


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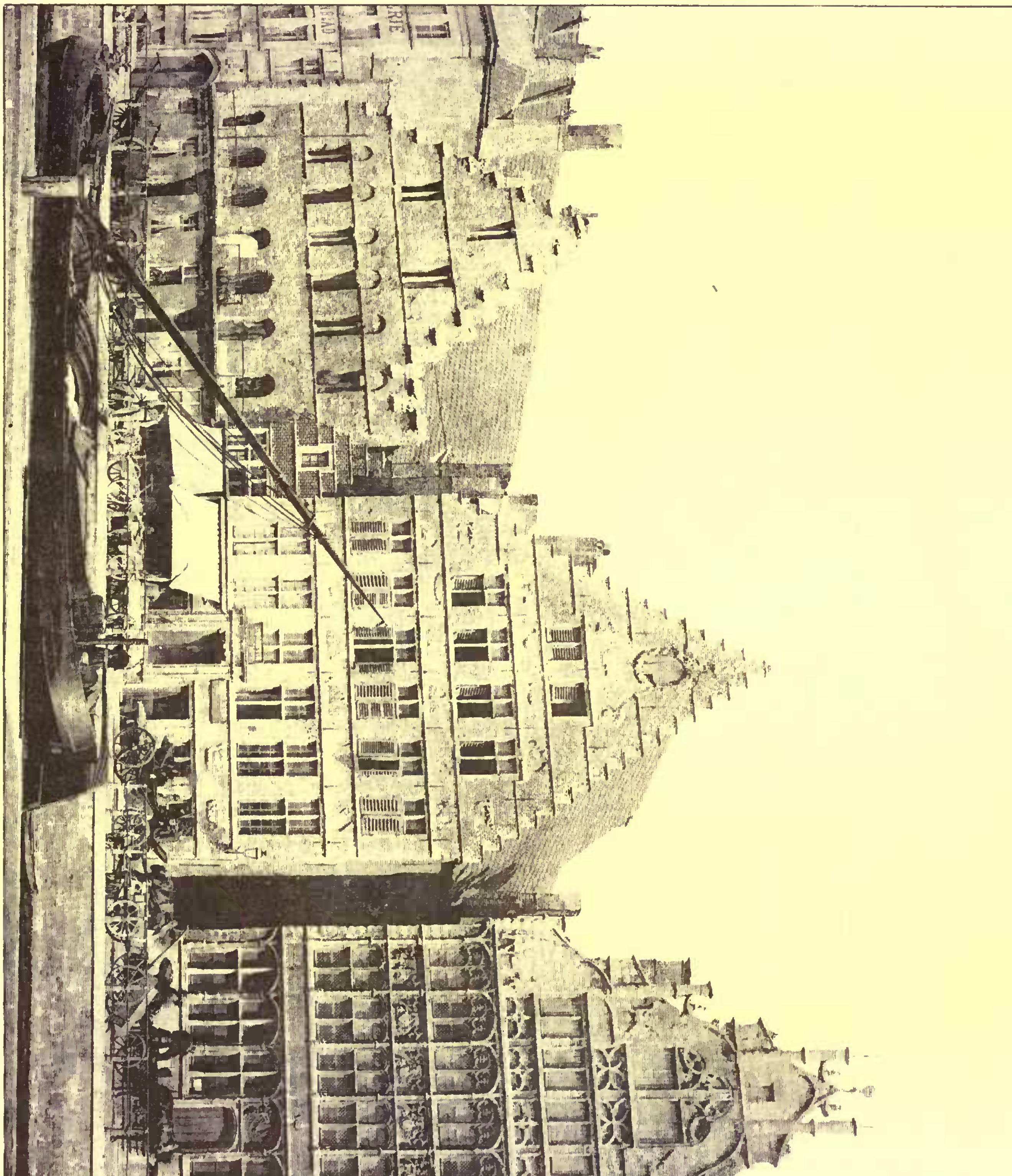
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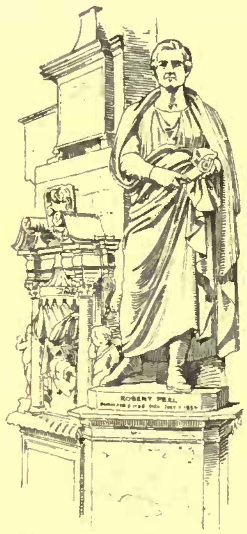
Maison des Bateliers, Ghent, Belgium, — 1884.

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London Monuments and Statues No. 6.



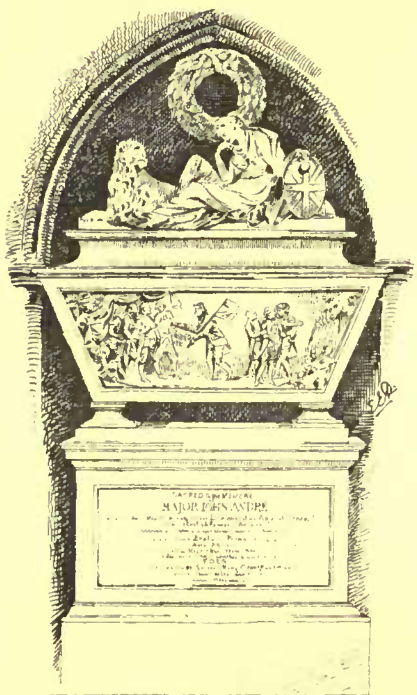
Rt. Hon. W. E. Gladstone
Walbrook. E. C.
Bruce Joy Sculptor



Sir Robert Peel Bart:
Westminster Abbey
Gibson Sculptor



William Wilberforce
Westminster Abbey
Joseph Sculptor



Major John André
Westminster Abbey
Van Gelder Sculptor



Henry Grattan
St. Stephen's Hall
Westminster Palace



St. Stephen's Hall Westminster Palace

John Selden
Robt. Walpole
Lord Chatham
Willm. Pitt (Earl of Chatham)
Henry Grattan

* * * * * *
Lord Somers
Lord Mansfield
Charles Jas. Fox
Edmund Burke



William Pitt (Earl of Chatham)
St. Stephen's Hall
Westminster Palace
Macdowell Sculptor

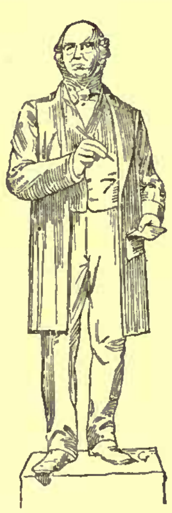
HELIOTYPE PRINTING CO. BOSTON

other enamels. His last authentic and dated terra-cottas, ornament the façade of San Domenico at Urbino: in the tympanum of the entrance, the bronze door which was made by Masaccio, Luca has placed a Madonna and child with two saints on either hand; and in the pediment above he has set a circular relief with a half-length of God the Father, surrounded by angels, and in an attitude of benediction. Masaccio's diary tells that he asked these works at Luca's hand, the only ones, it would seem that Luca ever sent across the Apennine's, and gives their date as well. Since it is so early a date as 1452, one feels sure that many another creation followed whose time cannot be fixed with such decision; but we learn that during the last ten years of his life, he was too feeble to do more than rejoice in Andrea's labors.

Among the many Della Robbias in non-Italian museums there is but one, it seems, which is indisputably a Luca. This is the huge polychrome relief with the arms of Réné of Anjou in the South Kensington collection. There are four others, however, and of greater importance, which one is tempted to ascribe to him; the "Monk Writing," also at South Kensington, and the three great circular reliefs in the Cluny Museum at Paris; two with allegoric figures of Temperance and Faith, one with a Virgin and child. The *rétable* in the Metropolitan Museum at New York is called, of course, a Luca, but as we shall see, it is an Andrea.

Let me add now that Luca did not repeat his terra-cottas, did not mould one in the pattern of another, but produced in each instance a wholly new creation. And I believe I may say as much for his immediate successors, though later on replicas became all too common. In another chapter I will try to vivify a little the brief bald catalogue I here have written. I will try, words being all too rough for so delicate a task, to explain a little the essential quality of Luca's art. M. G. VAN RENSSELAER.

ESTIMATING BY QUANTITIES.


Sir Rowland Hill, London, England.

THE appearance in a recent issue of the article headed "The Payment of Quantity-Surveyors," and which was copied from our contemporary the *Building News* of London, may make it welcome to many architects and builders to hear something more about this system of estimating by quantities as practised in England. It was generally introduced in London about twenty years ago, and met with so much support from architects and builders that it speedily found its way into the provincial towns, and is now the recognized practice even for the smallest contracts. The old way of estimating, such as it is practised in our country, had long been felt to be an insecure and unbusinesslike performance, especially for large and complicated structures, offering no protection to the builder against possible mistakes in his figuring; no security to the architect; and no guarantee to the owner.

The building business is a precarious one at any rate, full of risks and uncertainties. A builder would often be asked to give a figure for a contract in so short a time, that he could hardly familiarize himself with the drawings. Estimating under such conditions is reduced to a kind of rough-and-ready guess-work, and builders have to trust to "arranging matters somehow," should they find that they made a mistake in their price. Should such arrangements not be possible, the builder may land himself in bankruptcy; the architect will reap much trouble and discredit, and the owner will have to bear the loss. It was therefore thought desirable and just that builders should be furnished with more complete data than drawings and specifications alone upon which to base their estimates, and that they should have a *bill-of-quantities* of all materials and labor required for a contract. This had long been the practice in Paris, where, in addition, all estimates are based upon the official price-book of the City of Paris for public works, generally called "*Prisée de la Ville*," and where builders hand in their estimates upon a percentage discount on the prices of the above book. The frequent intercourse of English architects with their Parisian brethren no doubt influenced the adoption of quantity-surveying in England.

The surveyors were drawn from the ranks of builders' account and prime-cost clerks, where they had already acquired something of the proficiency which this new status called for, and before long clever and experienced men took up the line, and marked out a reliable and scientific system of measuring for every building trade. To-day, quantity-taking in London is a most minute and precise operation down to the smallest detail of builder's work. The quantity-surveyor writes the specification, having previously settled all items with the architect; he takes notes of all extra work or deviations and deductions occurring during the progress of a building, and finally measures up, and settles up the builder's claim.

At first the surveyors were employed in the architect's offices as a part of the general staff. It was, however, soon found that this arrangement complicated the business of large offices too much, and the surveyors were given an independent professional standing, with offices of their own, separate from the architects. The Institute had already formally sanctioned the new practice, and settled the rate of payment as follows: The surveyor to receive two-and-one-half per cent on the contract price, to charge for the lithographed specifications and the bills-of-quantities extra, the whole to be added by the builder to his estimate, and to be paid by him to the surveyor out of his first certificate. These rates to which the members of the Institute of Architects agreed to hold themselves were so favorable that many architects and draughtsmen left their calling and turned quantity-surveyors, and many years had not passed before it had, through competition, become the general practice for the surveyors to hand over one per cent of their two-and-one-half per cent to the architect who employed them, for it is in nearly all cases the architect who selects the quantity-surveyor. This practice caused some bad feeling, as may be readily supposed. Architects were soon compelled for the sake of their good name to sever all connection with or interest in the quantities, and thus the surveyor's commission has gradually become reduced to one-and-one-half per cent, and a good deal of work is now done at one per cent. It is very profitable at that, if there is a steady flow of business.

In course of time an important change was made in the position the quantities occupy towards the contract. At first the surveyor was made responsible for the correctness of his quantities, and they became part of the contract. The builder was bound to carry out the work as drawn and specified, and if, to do this, he found himself called upon to give more material and labor than he had estimated for per bill-of-quantities, the architect allowed him a claim for all over against the surveyor, who had to pay. I know personally of several cases where the surveyor was made to pay heavy sums for mistakes or omissions. The unfairness of this system became however soon apparent. Surveyors are often called upon to take off the quantities for a building in a very short time; they have to rely upon assistants, and the most careful man can make a mistake in multiplication, or apply a wrong scale to a drawing. Moreover, there are many building items as in plumbing, gas-piping, and interior finish that cannot be measured with perfect accuracy. For these reasons surveyors are now rarely made responsible for their quantities, and these latter do not constitute part of the contract. The builder hands in his estimate upon the bill-of-quantities supplied, and if his tender is accepted the quantities are sealed and kept by the architect until the final measuring up, when all extras or deductions are made upon the prices affixed by the builder himself to the bill-of-quantities. For all uncertain items, and for such work for which estimates are intended to be obtained at the finishing-up stage of a building it is now customary to place in the quantities liberal provisional sums settled between the architect and surveyor, and which are accounted for separately.

The economical soundness of the quantity system is proved by the fact that the builders are in its favor with one voice; that building has become a more safe and more profitable business, and that owners obtain better and more economical work for their money. And much arduous labor is taken from the shoulders of architects who enjoy a large practice, and the moral status of the profession has undoubtedly been raised. It would be very desirable that some system of quantity-surveying be introduced here, perhaps with certain modifications and less minuteness than practised in England, but of sufficient thoroughness to place estimating upon a sounder footing. Builders, architects and owners would soon appreciate its many advantages.

JOSEPH A. STARK, Architect.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

STORE FOR MARTIN RYERSON, ESQ., CHICAGO, ILL. MESSRS. ADLER & SULLIVAN, ARCHITECTS, CHICAGO, ILL.

THE dimensions of the buildings are 68′ x 170′, the piers and large constructive features of the front are of Bedford oolitic limestone, and the bay-window fittings between them of cast-iron and plate-glass. The side and rear walls are of bricks. The posts and girders throughout the interior are of iron, fire-proofed with porous terra-cotta. The floor joists measure 3″ x 14″, and are set to 10″ centres. The plastering is to be done on wire-cloth put on iron furring-strips, hung 2″ below the joists, and there will be a mor tar deafening 2″ thick over the joists. To prevent the spaces between joists from forming flues across the building, there are to be on the iron girders, brick walls extending the entire height of the joists; and to prevent thespaces behind the furring-strips from forming similar flues, brick ledges are to be built out above and below the joists, and the base will be formed of Keene's cement on these ledges. The two elevator shafts in the building will be made fire-proof, as also the boiler and engine room. The roof boards will be covered with porous terra-cotta. In short, an effort is being made to construct, without excessive cost a business building, the contents of which may burn without destroying the building itself. The quantity of wood finish will be reduced to a minimum, and all of that which is used, is to be of white-oak. The floors will be of narrow strips of maple. The cost of the completed building will be $130,000. The building is located most favorably for lighting, having light in front, rear, on the whole of one side, and on half of the other side.

DARTMOUTH COLLEGE LIBRARY (WILSON HALL), HANOVER, N. H. MR. S. J. F. THAYER, ARCHITECT, BOSTON.

This building, now approaching completion, is built of red brick and Longmeadow sandstone, with slate and copper for roofing. The portion containing waiting-room, reading-rooms, etc., is constructed with heavy timbers and planking, for both floors and roof, the former with wire-lath, iron furrings six inches on centres, and plaster for ceilings, with an upper floor of matched birch, on two layers of thick asbestos paper. The library proper or book-room has three tiers of stacks, one on a level with the main floor, one below, and one above, each seven feet six inches high. The whole capacity of this room is one hundred and thirty thousand volumes. It is contemplated to add one tier when needed. At present this space is to be used as a picture-gallery, partitions being set some distance from the walls, giving a plain surface about fifteen feet high, the whole length of the room, in proper relation to a large skylight. This book-room has iron stacks and perforated iron floors (except picture-gallery). An attempt has been made to get together the best detail for this system of storing books. The roof is carried on iron trusses seven feet apart, covered with plank, lag-screwed to the rafters and furred, lathed and plastered as before named. All partitions are of "plaster blocks," no wood studding or furrings being used except nailings for finish. The area of the building is 6060 feet, and the construction account will not materially vary from ten dollars per square foot.

MAISON DES BATELIERS, GHENT, BELGIUM.

This building, the one on the right of the view, was erected in 1531 by the Guild of the *bateliers.*

LONDON MONUMENTS AND STATUES.—PLATE VI.

PART OF THE FACADE OF THE NATIONAL BANK OF BELGIUM, ANTWERP, BELGIUM.

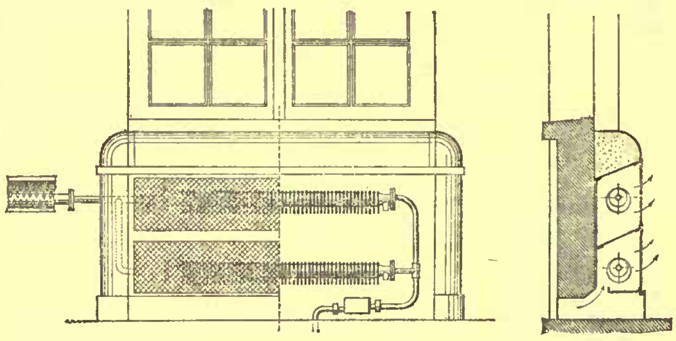
SOME FEATURES OF PARIS SCHOOL ARCHITECTURE.



The public-school system of Paris, and indeed of the whole of France, can be said to consist of three distinct departments: the district and common schools, the lysées, and the University, the latter including all of the higher colleges and technical schools. The French lysées do not correspond to any department of the public-school system of America, for while our high-schools are but connecting elements between the common schools and the colleges, the lysèes receive pupils of all ages, a previous training in the common schools not being necessarily called for, while some of them extend the course of training into what with us would be found only in a college. Besides this they assume entire control of the pupil, who pays a stated sum for tuition and generally lives within the school precincts, though in most of the larger lysées a certain number of pupils are received as *externes*, being in the school only during the day. The leading lysées of the city are of quite recent construction; indeed, the two which perhaps can best serve as types, namely, the Lysée Lakanal at Sceaux and the Lysée Janson de Saillie at Passy, were barely finished in season for the present fall term.

There is little in the smaller common schools to interest the architect. The arrangement is always very simple, with separate rooms for boys and girls, and a limited quantity of cheap, uncomfortable-looking furniture. The French hardly rise to an appreciation of any need for such desks and chairs as are found in the large American public schools. Indeed, according to the report of the Jury of the Exposition of 1878, we are thought to provide too luxuriously in this direction, and to make our school-boys discontented with the humbler fittings of their own homes.

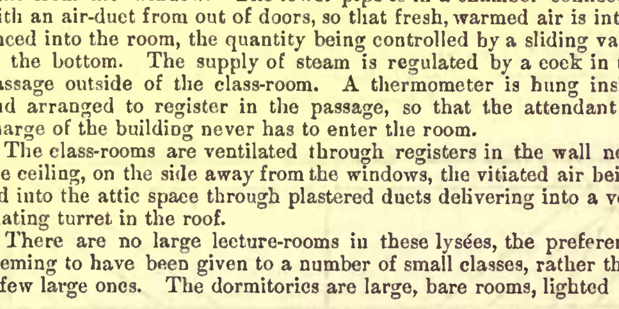
Of the lysées, nearly all are interesting architecturally, and a visit to Paris would not be complete without a careful study of at least one of the many which are scattered about the city. The two lysées above referred to are the latest expression of architectural thought in this direction, and it is interesting to note how little they differ in general arrangement of the plan, and in special features of accommodation, notwithstanding the fact that the Lysée Lakanal is located in the country, with unlimited land on all sides, and intended for *internes* only, while the Lysée Janson is in the closely-built-up quarter of Passy, on a site barely sufficient for the purpose, and receives pupils from outside. The plan in each case may be said to consist of a central portion devoted to the administration, with wings and Ls on either side containing the class-rooms, which are arranged continuously on the street side of the building, an open corridor serving as means of communication and extending entirely around the inner courts formed by the wings. The dining-hall and gymnasium occupy a position inside the court on the axis of the building, while the kitchen and dependencies, the infirmary, engine and boiler houses, and servants' rooms, are placed at the rear, completing the rectangle. The dormitories, professors' rooms, laboratories, and a few extra class-rooms occupy the upper story, while any attic space is neatly plastered all around and utilized in connection with the ventilating arrangements. This description would not exactly fit either of the lysées, but coincides with what may be taken as a typical plan of this class of school edifice. The class-rooms are small, not over four hundred square feet in area. So far as observed, no special effort is made to secure direct sunlight in these rooms. One feature which would strike an American school-boy as being peculiar is that in the door of each class-room is a small glazed peep-hole, through which a guardian, passing along the corridor, can see what is taking place inside. The rooms are lighted by windows on one side, the pupils being seated so that the light comes from the left. The heating is by steam, and it may be mentioned in



this connection that the heating and ventilation of both lysées, as well as of nearly all the more important buildings in the metropolis, is arranged and put in by Geneste *fils et* Herscher, heating engineers, who have acquired such a position as to entitle them to be regarded by the architects more as *collaborateurs* than contractors, and who are usually allowed to carry out their own ideas. The heating of the class-rooms is by a combination of direct and indirect radiation, as illustrated by the adjoining figure. The two rows of flanged pipe are placed under the window-seat, the upper pipe heating directly the air of the room, and compensating for any loss of heat from the window. The lower pipe is in a chamber connected with an air-duct from out of doors, so that fresh, warmed air is introduced into the room, the quantity being controlled by a sliding valve at the bottom. The supply of steam is regulated by a cock in the passage outside of the class-room. A thermometer is hung inside and arranged to register in the passage, so that the attendant in charge of the building never has to enter the room.

The class-rooms are ventilated through registers in the wall near the ceiling, on the side away from the windows, the vitiated air being led into the attic space through plastered ducts delivering into a ventilating turret in the roof.

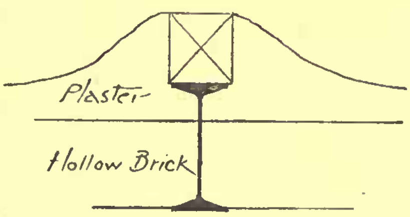
There are no large lecture-rooms in these lysées, the preference seeming to have been given to a number of small classes, rather than a few large ones. The dormitories are large, bare rooms, lighted on



both sides, containing from twenty-five to thirty beds, and arranged with one large window to each bed. There is no opportunity for anything like privacy on the part of the pupils, and hardly any closet room, beyond a large store-room shared in common. In the Lysée Janson, the windows are set about five feet from the floor, and underneath is built into the wall a small cupboard and set of shelves,

approximately as shown by the adjoining sketch. The dormitories are but slightly heated by a single line of corrugated steam-pipe running around the room, the temperature not being kept higher than 9° Centigrade. The ventilation is provided for in the same manner as described for the class-rooms. The washing appliances are all in one room adjoining the dormitories. The water-closets or more properly the privies — *systême diviseur aux cuvettes* — are located in the court-yard, and have the primitive *sans façon* arrangements so familiar to any one who has ever sojourned in France.

The dining-rooms are on the ground floor as previously explained. In the Lysée Janson there are two, both at some distance from the kitchen, with which they are connected by a small tramway. The eatables are wheeled into position in a hand-car, and distributed to the tables in a wholesale, garrison-like manner which is doubtless quite expeditious and economical of help, but which would hardly tend to improve the table-manners of the students. The floors are tiled, and the walls painted over the plaster or provided with high cement dadoes. The tables are of the ordinary iron, marble-top, restaurant pattern, and the students sit six or eight at a table on plain benches. Not quite equal to Messrs. Ware & Van Brunt's generous accommodations in Memorial Hall, Harvard.

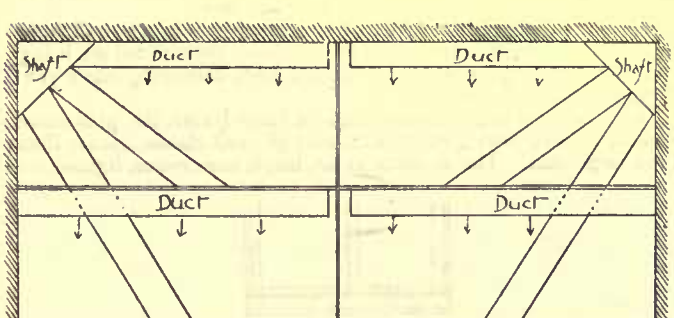


The construction in both of the lysées is fire-proof throughout. The floor-beams are of iron, spaced quite close together and made correspondingly light, and filled in flush with plaster, or better yet, as observed in a few cases, with long, hollow bricks made to just rest on the flanges; and set and levelled up with plaster. Wooden sleepers are laid over the beams and thoroughly bedded in plaster, so that no wood is exposed. The sketch shows this construction.

In neither of the lysées was there any general reading or sitting room for the boys. Indeed, while everything was well arranged for work, the provisions for play or quiet comfort were very insignificant. Possibly French school-boys never feel any need for such conveniences: certainly they have very few in the lysées.

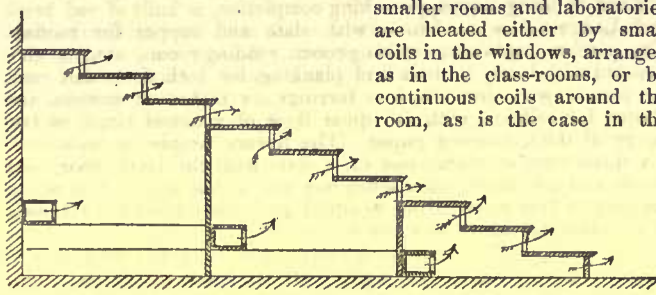
As a type of the superior technical schools, the recently completed building for the Ecole Centrale des Arts et Manufactures is perhaps the best example that could be chosen. It is located in the heart of the city, and receives *externes* only. The plan consists essentially of four wings forming a rectangle, and enclosing a large open court. Across the front on the ground floor are the rooms for the administration. On the right is the dining-room, a wide passage extends around the court, with stairs at each angle. The upper floors are arranged with amphitheatres at each corner; physical laboratories, reading-rooms, etc., across the front; and double rows of class-rooms on each side and at the back, reached by wide central corridors. In the top story, at the sides, are the large chemical laboratories for the students, and smaller similar rooms across the front for individual research.

The most interesting features about the building are the arrangements for heating and ventilating, which are very complete and extensive, and promise to be quite successful in operation. The heating is mostly by steam. The small class-rooms are heated in the same manner as the class-rooms in the lysées previously described. The large amphitheatres at the corners are heated directly by two radiators in the room itself, and indirectly by coils in the cellar, over which air is drawn from out of doors, and forced by fans up two large shafts,



one at each corner of the room, which connect with ducts or chambers in the space under the raised floor of the room. Along the fronts of these ducts are gratings, from which the warm air escapes and passes into the room through the open risers. The space under the floor is divided into three sections by tight partitions, so that the heat can be drawn from one duct or all, as desired. The accompanying figures will illustrate this arrangement. The ducts are made entirely of plaster, the walls being about an inch-and-a-half thick.

The dining-room is heated by hot-air furnaces in the cellar, and the smaller rooms and laboratories are heated either by small coils in the windows, arranged as in the class-rooms, or by continuous coils around the room, as is the case in the



chemical laboratory. The coils referred to are throughout of the excentric disc pattern shown on the first figure. The corridors are heated only by the steam-supply pipes, which are run on the ceilings. The class-rooms are kept at 15° to 16° Centigrade; the amphitheatres at 20° Centigrade, and the stairways and dining-room at 12° to 14° Centigrade.

The class-rooms have ventilating registers in the inner walls at top and bottom, from whence the vitiated air is drawn up into the attic. Similar ventilation flues lead also from the amphitheatres. The chemical laboratories have ventilating registers in the walls, and also special flues connected with the chamber in each desk serving to carry off fumes from acids, etc. All of these flues are constructed of plaster in the same manner as the hot-air ducts, and are brought together in the attic, and led to large ventilators in the roof. The draught is forced by large exhaust fans, worked by Gramme electric-machines. The application of electricity to such a purpose is considered to a certain extent experimental, but thus far the results seem to have been very satisfactory. It certainly is extremely convenient, the motor being quite small and easily located in positions where shafting or long belts would be impracticable. The power is communicated to the fan by a small belt running from the pulley wheel of the motor, which revolves at the rate of 1000 turns per minute. The generator is placed in the cellar. By an ingenious arrangement of resistance-coils, if the belt is broken or loosened, the number of revolutions of the motor is greatly increased, and the intensity of the current lessened, whereby a connection is broken, and a signal rung in the engine-room, by which the disorder is at once located. Even should one of the fans cease to operate for a considerable time, the ventilation would not be seriously interfered with, as the ventilation shaft in the roof would act naturally to a considerable extent.

The construction of the building is fire-proof throughout, of the same description as explained for the Lysées. It is interesting to note how freely plaster is used everywhere. In the attic everything is covered with it; floor beams, under side of roof and vertical surfaces. The stairs are of iron construction, but filled in solid, so that in case of fire they will not be the first to bend and fail, as would otherwise be the case. Altogether the Ecole Centrale is about as practical a building as one ever meets, and though the plan could hardly be simpler, it is very compact, and well adapted to the requirement of the school.

C. H. BLACKALL.

PLANS FOR A TURN-HALL.

NEW YORK, February 24, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Of all the gymnastic establishments which are known to me, and they are many, the "German Gymnasium" in St. Pancras Road, London, England, is, in my opinion the best arranged. It is convenient and compact, and gives an impression of largeness, although contained upon a comparatively small space. The gymnasium-hall proper is spacious and lofty, with good light and ventilation, and there is a fine entertainment and meeting room with a small stage attached. The building is erected between two party-walls, and has no side lights, and its general plan can be adopted for a society of any number of members. It would be presuming too much upon the kindness of the Editors to give a detailed description of this plan, but if your correspondent will communicate with me, I will give him any information he may desire. Yours respectfully,

JOSEPH A. STARK, Architect.

COMPETITIONS.

BUFFALO, N. Y., March 3, 1885.

TO "W," AUTHOR OF LETTER TO THE *American Architect,* February 21, 1885.

Dear Sir, — If you care to set the ball rolling, I will engage to send a protest from the six best architects in western New York on "the right to reserve all prizes" in the Richmond Competition advertisement in the *American Architect* of February 28, 1885.

Each man will certainly be willing to send at the same time $1.00 to the *American Architect,* as a nucleus fund until we can get together next winter and organize a small "Union Génerale." I

propose you assume to yourself the right to call such meeting, or get the paper to do so, for some time in November or December, in New York or Boston, and that meantime you learn from the Institute what assistance, if any, may be had from them, and perhaps the Western Association also.

Though I am aware there will be much work and disappointment before we can correct any, the slightest abuse, I am willing to give you all the assistance in both time and money I can command, as I think your way of going at it a good one. Mr. Illsley will assist the movement, and I will engage to start similar interest in Chicago, St. Paul, Minneapolis, Milwaukee, Louisville and Rochester.

I shall be glad to hear from you in the matter, and have suggested the Richmond job in no expectation of being able at so late a day to get *that corrected*, but merely with the thought it was a sufficiently red rag for the architectural bull.

Very sincerely, Edward Kent.

["W" sends us the foregoing letter, with privilege to use it at our discretion. — Eds. American Architect.]

El Paso, March 1, 1885.

To the Editors of the American Architect: —

Dear Sirs, — The last article on "Competitions" in your paper has a great deal of truth in it, and I, for one, will go into any scheme that will help towards better methods in conducting them. Have been through two of them lately, and cannot say a good word about either.

Respectfully, E. Krause.

New York City, March 9, 1885.

To the Editors of the American Architect: —

Dear Sirs, — As the leading architectural journal of the country, you owe it to yourselves and to your subscribers to set a good example in the matter of conducting a competition. In my communication of last week, regarding the recent "stable competition," I suggested that the cost of the designs submitted should be assessed by one competent man, as if for execution in Boston. Your editorial comment on this was that it would be too expensive, and you ask, who would pay for the estimates? I would respectfully suggest some such arrangement as the following: Instead of offering three prizes of thirty dollars, let it be three prizes of twenty-five dollars each. The fifteen dollars thus mulcted from the prizes ought to pay for reliable estimates on even one hundred designs. It would if some such plan as this was followed: Let the main quantities be taken off by a competent draughtsman — not every item, but enough to serve as a fair index of cost. Let these quantities then be submitted to a practical builder, with the designs, and I think he could dispose of the designs in one day. A competent builder for such designs could be had for five dollars. Instead of reserving a fixed sum for obtaining estimates, let it fall, whatever it might be, on the prize winners. I would rather have the prize twenty dollars, if need be, than to run the risk I pointed out in my former communication.

In your issue of February 21 there was a communication, signed "W.," which was vigorous and to the point. His suggestion regarding competitions I would like to see carried out in good faith. The competition for the city-hall at Richmond would be a good one to try it on first. I wrote to the promoters, asking for information concerning the manner of the award, and received a reply to the effect that a committee of the common council, assisted by the city engineer as an expert, would constitute the jury, and that I might sign my plans with a *nom de plume* or my real name, just as I liked. After such a naïve admission, I decided not to compete.

I am yours, etc. W.

[In the next competition we announce, we will endeavor to put into execution our correspondent's suggestion, or a modification of it, but we are free to say that we do not believe any builder we would be willing to trust would furnish estimates on the terms mentioned. Apparently, if all architects were "W's," a cure might be found for the competition evil. — Eds. American Architect.]

CONNECTION OF STONE AND WOOD WALL IN HOUSE AT "DELLWOOD," WHITE BEAR LAKE, NEAR ST. PAUL, MINN.

Boston, January 26, 1885.

To the Editors of the American Architect: —

Dear Sirs, — In an illustration of a house by Mr. Cass. Gilbert, which appeared in a recent number of the *American Architect*, a part of the exterior which is shingled butts against a rough rubble wall. Would you kindly explain how the junction of wood and irregular masonry is effected so as to keep out the rain?

Yours truly, An Office Boy.

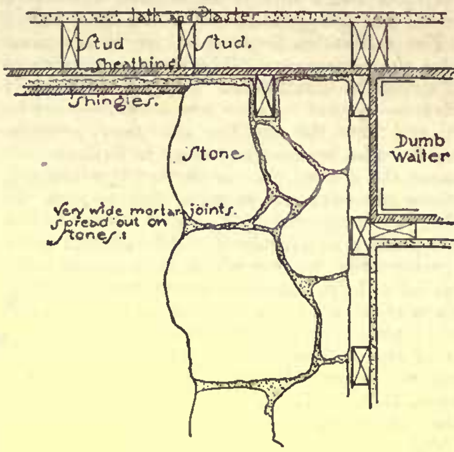
To this Mr. Gilbert replies as follows:

St. Paul, Minn., February 21, 1885.

To the Editors of the American Architect: —

Dear Sirs, — In answer to yours of 27th January, I would say that the construction of the house at Dellwood, at point mentioned, is, to the best of my remembrance, as per sketch herewith and notes accompanying same.

The foundations for the building were put in very late in the fall, and completed to the top of first-floor joists, which were set and covered with a rough flooring. In the following spring the carpenter-work was commenced, while it was yet too cold and frosty to risk the construction of mason's work, and the framing was done and sheathed (being carried on temporary posts and braces) before the stone wall at this point was recommenced. After stone-work[1] was completed, it was allowed to settle and thoroughly dry out before the posts and braces were removed and framing allowed to rest upon it. And finally all joints were carefully made tight by repointing with cement mortar and leaving a grooved joint for the shingles to fit into. I would also say that the shingles themselves were thoroughly soaked in oil (each batch as required) for several days before being used, and, on completion of the house, given another coat of oil and stain. This makes the wood at the point in question impervious to water, and prevents, in my opinion, rot that might be caused by water getting back of shingles at the joint with stonework.



Yours respectfully, Cass. Gilbert.

THE VOTE FOR THE BEST TEN BUILDINGS.

Philadelphia, Pa., March 9, 1885.

To the Editors of the American Architect: —

Dear Sirs, — In reference to your invitation for "votes" on the best ten buildings, etc., — is it understood that the voters' names appended to their lists will be considered as confidential? Also, is personal inspection of the buildings necessary to form an opinion?

H. M.

[The identities of the voters will not be revealed. A personal knowledge is of course desirable but not essential, since photographs and published drawings may furnish all that is needed in forming an opinion of a building. — Eds. American Architect.]

NOTES AND CLIPPINGS.

A Museum of Decorative Art, Paris. — A special museum of decorative art is to be built in Paris on the Quai d'Orsay, and will be ready for the grand centenary of the republic in 1889. While planning new buildings, the Parisians, however, are at last looking to the preservation of old architectural treasures, and the Society of the Friends of Parisian Monuments have set to work to rescue the sculpture on the Porte St. Denis, which is gradually being destroyed, and to draw up a list of all similar relics of the past likely to be pulled down unnoticed. —*New York Evening Post.*

A Curious Mexican Suspension Bridge. — Mr. J. Foster Flagg, M. Am. Soc. C. E., describes a bridge which was remarkable for being the work — from his own design — of an ordinary uneducated Mexican laborer or peon, combining, as it did, crudely, several principles of bridge construction. Bridges in Mexico are generally built of arched masonry, anything like a truss being, before the advent of railroads, almost unknown. In the State of Colima, where this particular structure was built, there were very few bridges of any description, and those few the ordinary arched ones. The peon referred to was, some four years ago, the ferryman where a trail for cargo mules crosses the River Armeria. He happened to see a copy of *Harper's Weekly*, which had in it an illustration of a suspension bridge. As a result of his study of this picture, he put up a structure quite closely imitating the ordinary suspension bridge; the cables and suspenders being twisted from wild vines (vejucos), the cables being passed over rude frames for towers, and anchored to huge boulders in the river banks. The whole structure was built without nails or metal of any kind. It was carried away by a heavy freshet the same year, and directly afterwards the same man built another structure quite original in design. It was also put together without nails or metal. The cable was formed of wild vines twisted, and all the joints tied together with lighter vines, no manufactured rope being used in the structure. The piers were made by driving light piles into the river bed, in the form of a square, tying them together with other poles, and filling with stone. The towers were natural forked sticks; the top fork being used to support the cable, and the lower fork to support the timbers. The timbers upon these forked sticks were really rude cantilevers, weighted at the shore end and supporting the timbers of the central span. The only point of attachment of the cable was at the centre of the bridge. The roadway was of rude joists and boards, sufficient to pass one animal. The bridge was strong and rigid.

[1] The stone here used were such as could be gathered from the lake shore, and are rough, broken and rounded granite boulders and "nigger-heads" of colors varying through light-yellow, brown, red, green and black. The mortar used was mixed from Redwing lime and Louisville cement. The framing was done before stone-work was completed, then sheathed and covered with tarred paper, which was carried in back of stone-work, and over a 2″ x 4″ stud set on to sheathing to break the straight joint. The stone-work was carefully repointed after it had dried out, a cement joint being made next to the paper, into which joint ends of shingles were worked.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report ten permits have been granted, the more important of which are the following: —

Jos. H. McAfee, 2 three-st'y brick buildings, n s Biddle St., between Valley and Ensor Sts., and two-st'y brick building in rear.

Jas. Thurston, 20 two-st'y brick buildings, s w s Calhoun St., n of Presburg, and 2 two-st'y brick buildings, w s Gilmor St., near s w cor. Presburg St.

Boston.

BUILDING PERMITS. —*Brick.* — *Hanover St., No.* 155. *Blackstone St., No.* 163, *and North Centre St., Nos.* 115-119, mercantile, 48′ 6″ x 59′ 6″ x 64′; Asher Ratchesky, owner; Sampson, Clark & Co., builders.

Huntington Ave., near Wigglesworth St., school-house, 114′ x 116′; owner, City of Boston.

Boylston Ave., near Green St., tenement, 54′ x 64′; owner and builder, Patrick Meehan.

St. Botolph St., No. 207, dwell., 25′ x 50′; owner, Chadwick Stillings; builder, O. L. Stillings.

West Chester Park, Nos. 220-232, 7 dwells., 23′ x 50′; owner, Chadwick Stillings; builder, O. L. Stillings.

Huntington Ave., No. 242, dwell., 25′ x 50′; owner, Chadwick Stillings; builder, O. L. Stillings.

West Chester Park, dwell., 25′ x 50′; owner, Chadwick Stillings; builder, O. L. Stillings.

Gordon St., cor. Call St., apartment-house, 57′ 8″ x 82′ 9″; owner, Thomas P. Proctor; builder, J. H. Besarick.

Brooklyn.

BUILDING PERMITS. — *Grand Ave.*, e s, 90′ s Park Ave., 3 three-st'y frame tenements, tin roofs; cost, each, $3,500; owner, James Carey, 204 Clermont Ave.; architect, J. F. Carey; builders, Long & Barnes.

Noble St., n s, 120′ e Franklin Ave., three-st'y frame tenement, felt and gravel roof; cost, $4,860; owner, Nathaniel Roe; architect, Frederick Weber; builder, John Fallon.

Newell St., e s, 250′ s Nassau Ave., three-st'y frame tenement, felt and gravel roof; cost, $3,950; owner, Isaac A. White; architect, Frederick Weber; builder, John Fallon.

Fourth Ave., s e cor. Sixteenth St., 3 three-st'y brick stores and tenements, tin roofs; cost, $20,000; owner, Charles Boenau, cor. Fourth Ave. and Sixteenth St.; architect, Walter Coots; builders, Assip & Buckley.

Penn St., s s, 120′ e Marcy Ave., 2 three-st'y brown-stone tenements, tin roofs; cost, each, $7,500; owner, M. Moser, 435 Sixth St., New York; builders, George Lehrian & Sons.

Skillman Ave., No. 111, three-st'y frame tenement, tin roof; cost, $4,500; owner and architect, Robert Mullen, 166 East One Hundred and Nineteenth St., New York; builder, John Rueger.

Sumner Ave., e s, 60′ s Macon St., two-st'y brick stable, felt and gravel roof; cost, $3,500; owner, Wright Travis, cor. Willoughby and Bedford Aves.; architect, J. Sands; builder, Philip Sullivan.

Kosciusko St., n s, 100′ w Stuyvesant Ave., 16 two-st'y brick dwells., tin roofs; cost, $45,000; owner and architect, Thomas Ellson, 1134 Lafayette Ave.; builders, W. Maske and John Rueger.

Central Ave., w s, 50′ s Melrose St., three-st'y frame store, tin roof; cost, $4,000; owner and builder, John Bosch, 696 Flushing Ave.; architect, Th. Engelhardt.

Sumpter St., n s, 100′ e Howard Ave., three-st'y frame tenement, tin roof; cost, $4,250; owner, Chas. Schmitt, New York; builders, Charles Horn and Jacob L. Pirring.

North Ninth St., s s, 100′ e Third St., three-st'y frame tenement, tin roof; cost, $3,500; owner, Peter Crowley, 376 Third St.; architect, Th. Engelhardt; builders, Peter Crowley and Jos. Wagner.

Myrtle Ave., junction of De Kalb Ave. and Cedar St., 4 three-st'y brick tenements and stores, tin roofs; cost for all, $30,000; owner and builder, Fred. Herr, 778 Broadway; architect, Th. Engelhardt.

Jefferson St., s s, 200′ w Marcy Ave., 6 three-st'y brown-stone dwells., tin roofs; cost, each, $9,000; owner and builder, Harman Phillips, 289 Jefferson St.; architect, I. D. Reynolds.

Grand St., Nos. 81 *and* 83, n s, 137′ e Second St., one and two st'y brick skating-rink, tin roof; cost, $10,000; owner, E. H. Schlueter, Grand St., cor. Second St.; architect, Th. Engelhardt; builder, not selected.

Broadway, No. 797, e s, 25′ s Adams St., four-st'y frame store and tenement, tin roof; cost, $5,500; owner, Louis Wagner, Bushwick Ave.; architect, Th. Engelhardt; builder, not selected.

Lewis Ave., No. 12, w s, 75′ n Stockton St., two-st'y frame dwell., tin roof; cost, $3,500; owner, Frederick Koch, Hopkins St.; architect, Th. Engelhardt; builder, Jos. Friese.

Lafayette Ave., n s, 175′ e Sumner Ave., 5 two-st'y brown-stone dwells., tin roofs; cost, each, $5,000; owner, John Cregier, 125 Vernon Ave.

Van Buren St., n s, 105′ w Sumner Ave.; 6 two-st'y brown-stone dwells., tin roofs; cost, each, $4,500; owner, architect and builder, F. Sloat, 286 Kosciusko St.

Manhattan Ave., s e cor. Freeman St., four-st'y brick store and tenement, cement and gravel roof; cost, $6,800; owner, Joseph Geise, 312 Eckford St.; architects, Randall & Miller; builders, Port & Walker.

Tompkins Ave., e s, 91′ n Jefferson St., two-st'y brick dwell., tin roof; cost, $4,800; owner and builder, Jas. W. Stewart, cor. Quincy St. and Tompkins Ave.; architect, I. D. Reynolds.

ALTERATIONS. — *West St.*, s e cor. Kent St., add a story to two wings; cost, about $4,000; owner, Eberhard Faber, 719 Broadway, New York; architect, Wm. T. Hallett; builder, not selected.

Chicago.

RESTAURANT-BUILDING. — F. L. Charnley, architect, has completed plans for four-st'y structure, 45′ x 190′, of brick, iron and terra-cotta, on Adams St., between Clark and Dearborn Sts.; will be occupied as a restaurant by the owner, H. M. Kinsley; cost, furnished, $250,000.

BUILDING PERMITS. —Wm. Lange, two-st'y dwell., 24 Bauman St., cost, $3,000.

M. Kaufman, 2 two-st'y dwells., 551 Hurlbut St.; cost, $10,000; architect, Geo. Spohr; builder, Geo. L. Frank.

H. Corinth, 2 three-st'y stores and dwells., 531 and 533 West Madison St.; architect, L. B. Dixon; builder, J. Phillips.

Mrs. M. Eichenberg, three-st'y flats, 181 Huron St.; cost, $4,500.

F. W. Koerps, two-st'y dwell., 3223 Wentworth Ave.; cost, $4,000.

H. Scheplock, three-st'y store and flats, 150 Osgood St.; cost, $3,500.

J. S. Kirk & Co., six-st'y warehouse, 340 North Water St.: cost, $25,000.

L. Rank, two-st'y flats, 178 Ambrose St.; cost, $3,000; architect, A. Bessler.

J. F. Gubbins, two-st'y dwell., 224 Laflin St.; cost, $2,500.

C. S. Bowl, five-st'y warehouse, 245 and 247 Kinzie St.; cost, $15,000; architect, L. B. Dixon; builders, Angus & Gindele.

O. B. Taft, basement, 3014 Michigan Ave.; cost, $5,000.

J. A. Larson, three-st'y flats, 273 North Franklin St.; cost, $6,000; architect, J. Otter; builder, J. A. Larson.

N. P. Chidester, two-st'y dwell., 434 West Congress St.; cost, $3,500; architect, W. H. Drake.

M. Callahan, two-st'y dwell., 84 Flournoy St.; cost, $3,000.

Carden & Crowley, two-st'y dwell., 797 Taylor St.; cost, $4,500; architect, P. W. Ruehl.

Mrs. J. Derlin, two-st'y dwell., 2741 Archer Ave.; cost, $5,000; architect, J. Huber.

W. J. Leadbeater, 2 two-st'y dwells., 361 and 363 West Jackson St.; cost, $11,000.

P. Wilkin, two-st'y dwell., 259 West Division St.; cost, $3,000.

T. Wilson, two-st'y dwell., 12 Campbell Ave.; cost, $2,800; architect, Hancock.

C. Eichenold, two-st'y dwell., 3836 Dearborn St.; cost, $3,700.

New York.

CHURCH. — For the Reformed Dutch Church, of Harlem, a church, chapel and parsonage, to cost $80,000, is to be built on the n w cor. of One Hundred and Twenty-third St. and the Sixth Ave. Boulevard, from plans of Mr. J. R. Thomas.

SCHOOLHOUSE. — For the St. Joseph Roman Catholic Church, on Grove St., a fire-proof schoolhouse, to cost $120,000, is to be built from plans of Mr. Arthur Crooks.

STABLES. — A depot and stables, to cover an area of 33,000 square feet, is to be built for the Forty-second Street, Manhattanville & St. Nicholas Ave. Railroad Company, on One Hundred and Twenty-ninth and One Hundred and Thirtieth Sts., Manhattan Street and Twelfth Ave., from plans of Messrs. Thayer & Robinson.

STORE. — For the Misses Major, a five st'y iron-front brick building is to be built at No. 438 Broome St., at a cost of $45,000, from plans of Mr. Edward Kilpatrick.

BUILDING PERMITS. — *Bayard St., No.* 9, five-st'y brick store and dwell., tin roof; cost, $9,000; owner, Betsy Rubin, on premises; architect, Chas. Rents.

Canal St., No. 368, five-st'y brick store, gravel roof; cost, $18,000; owner, J. A. Roosevelt, 32 Pine St.; architect, Stephen D. Hatch; builders, M. Eidlitz & Son and A. G. Bogert & Bro.

Lafayette Pl., n e cor. Fourth St., seven-st'y brick factory, asphalt roof; cost, $200,000; owners, Roswell Smith and Theo. L. De Vinne, 54 East Fifty-fourth St.; architects, Babb, Cook & Willard.

West St., No. 259, rear, three-st'y brick tenement, tin roof; cost, $3,000; owner, Samuel Carey, 335 West Fifty-fourth St., trustee for Elizabeth Bentinck; architect, M. C. Merritt.

West Eleventh St., No. 283, five-st'y brick tenement, tin roof; owner, James A. Hayden, 80 Madison Ave.; architects, Hubert Pirsson & Co.

Greenwich St., No. 328, six-st'y brick store, tin roof; owner, Diederick Fink, 106 West Washington Pl.; architect, J. W. Cole.

Hall Pl., No. 1, n e cor. Sixth St., five-st'y brick store and tenement, tin roof; cost, $12,000; owner, Caroline Bosch, 223 Sixth St.; architect, J. Boekell.

Thirty-seventh St., s s, 225′ e Eleventh Ave., 2 five-st'y brick tenements, tin roofs; cost, $12,000 each; owner, Wm. Niebuhr, 350 East Seventy-seventh St.; architect, Wm. F. Niebuhr; builders, Wm. & Wm. H. Niebuhr.

West Forty-fifth St., No. 414, three-st'y brick stable and dwell., tin roof; cost, $8,000; owner, W. W. Wall, 233 West Forty-fifth St.; architects, De Lemos & Cordes.

Fifty-seventh St., n s, 225′ e Seventh Ave., 2 four-st'y brick dwells., tin roofs; cost, $23,000 and $25,000; owner, Ashley A. Vantine, 877 Broadway; architects, D. & J. Jardine.

Fifty-seventh St., n s, 226′ 6″ e Seventh Ave., four-st'y brick dwell., tin roof; cost, $22,000; owner and architects, same as last.

West Twenty-eighth St., Nos. 423-127, seven-st'y brick piano-factory, tin roof; cost, about $40,000; owner, C. S. Fischer, 152 West Fifty-eighth St.; architect, W. B. Tubby.

West Forty-fifth St., No. 513, four-st'y brick tenement, tin roof; cost, $9,500; owner, Jacob Schmidlapp, 441 East One Hundred and Twentieth St.; architect, C. F. Ridder, Jr.

West Twenty-fourth St., No. 518, one-st'y brick shop, gravel roof; cost, $3,000; owner, Benjamin Moore, by J. Wells, attorney, 191 Ninth Ave.; architect, J. B. Franklin; builder, J. D. Miner.

Ninth Ave., n w cor. Thirty-eighth St., 2 five-st'y brick stores and tenements and one extension, tin roof; cost, $14,000 and $16,000; owner, Andrew Ewald, 432 Fifty-first St.; architect, J. M. Forster.

Third Ave., n e cor. One Hundred and First St., 4 five-st'y brick tenements and stores, tin roofs; cost, total, $64,000; owner, Michael Duffy, 156 East One Hundred and Second St.; architect, Andrew Spence.

East Sixty-fourth St., No. 227, three-st'y brick stable and dwells., tin roof; cost, $8,000; owners, Bloomingdale Bros., Third Ave., cor. Fifty-sixth St.; architect, A. Wagner.

First Ave., n e cor. Eightieth St., 2 five-st'y brick stores and tenements, tin roofs; cost, corner, $15,000, other $10,000; owner, New York Protestant Episcopal School Society, 1517 Broadway; architect, John Sexton; builders, Van Dolsen & Arnott and L. Williams.

Eightieth St., n s, 54′ e First Ave., 2 five-st'y brick tenements, tin roofs; cost, $10,000 and $13,000; owner, architect and builder, same as last.

Eighty-third St., s s, 275′ e Tenth Ave., two-st'y brick stable, tin roof; cost, $10,000; owner, Margaret Deeves, 243 East Thirteenth St.; architect and builder, Richard Deeves.

Second Ave., s e cor. One Hundred and Twenty-sixth St., 4 five-st'y brown-stone tenements, tin roofs; cost, total, $64,000; owner, John Van Dolson, 125 East Eighty-third St.; architect, A. Spence.

One Hundred and Thirty-fifth St., s s, 100′ e Eighth Ave., one-st'y brick skating-rink, tin roof; owner, Edw. H. M. Just, 35 Great Jones St.; architect, M. C. Merritt.

One Hundred and Twenty-ninth St., s s, 200′ w Seventh Ave., 6 three-st'y brown-stone dwells., tin roofs; cost, each, $10,000 and upwards; owner, Mattie A. Cockburn; architect and builder, E. H. Cockburn.

One Hundred and Fifty-seventh St., s s, 100′ e Tenth Ave., three-st'y frame dwell., tin and shingle roof; cost, $4,000; owner, Asbury Lester, 240 West One Hundred and Twenty-fourth St.; architect, H. Fouchaux.

Kingsbridge Road, n e cor. Central Ave., two-st'y and attic frame dwell., tin roof; cost, $12,000; owner, Nettie Lynch, 558 Lexington Ave.; architect, C. Abbott French.

Fulton Ave., Nos. 1346 *and* 1348, near One Hundred and Sixty-eighth St., 2 two-st'y frame dwells., tin roofs; total cost, $7,000; owner, Stephen Moser, 136 West Fifty-second St.; architect, J. Kastner.

ALTERATIONS. — *Fifty-fourth St., No.* 407, three-st'y brick extension, tin roof; cost, $3,000; owner, Henry Elias, 403 East Fifty-fourth St.; builders, J. & L. Weber.

West Fifty-eighth St., Nos. 408-416, internal alterations; cost, $10,000; owner, Jacob F. Stier, Brooklyn; architects, Gilbert & Thompson; builder, C. W. H. Elting.

Third Ave., n e cor. Forty-third St., five-st'y brick extension, tin roof; cost, $10,000; owner, B. T. Kearns, 308 East Eighteenth St.; architect, J. A. Reiner; builders, Thos. Cockerill and John Rueger.

Park Ave., s w cor. Fifty-seventh St., four-st'y brick extension for elevator-shaft; cost, $3,500; owner, Chas. Graef, 4 West Forty-eighth St.; architect, Stephen D. Hatch; builders, Crane Bros. and Jas. Elgar.

Philadelphia.

BUILDING PERMITS. — *Woodland Ave*, w of Fiftieth St., one-st'y chapel, 26′ x 70′; also, one-st'y addition to chapel, *Poplar St.*, w of Twenty-seventh St., 15′ x 30′; Frank W. Tweed, contractor.

Columbia Ave., e of Fifteenth St., three-st'y store and dwell., 18′ x 60′; Chas. P. Griel, contractor.

Eighth St., w s, below Huntingdon St., 9 two-st'y dwells., 15′ x 47′; John Loughran, owner.

North Front St., No. 2127, two-st'y brick building, 13′ x 32′; Valentine Lint, contractor.

Albert St., w of Twelfth St., 2 three-st'y dwells, 15′ x 24′; Amos Supplee, owner.

Roxborough Ave., above Ridge Ave., two-st'y dwell., 20′ x 26′; J. B. Muir, owner.

Marshall St., above Girard Ave., three-st'y dwell., 22′ x 24′; Joseph G. Huber, contractor.

Twelfth St., above Susquehanna Ave., three-st'y dwell. and stable, 17′ x 41′, and 17′ x 28′; R. McClellan, contractor.

Ingersoll St., w of Twenty-second St., three-st'y dwell., 16′ x 41′; Harbach & Auchter, contractors.

Moore St., e of Third St., 3 two-st'y dwells., 15′ x 42′; David France, owner.

Columbia Ave., No. 1424, three-st'y store and dwell., 20′ x 76′; Wm. E. Beetern, owner.

Twenty-sixth St., above Oxford St., 6 two-st'y dwells., 16′ x 46′; O. A. Guenthner, contractor.

Oxford St., No. 2629, two-st'y dwell., 17′ x 42′; Wm. Chambers, owner.

Germantown Road and Huntingdon St., n e cor., three-st'y store and dwell., 20′ x 54′; Francis McGill, owner.

Emerald St., bet. Alleghany Ave. and Madison St., 2 two-st'y dwells., 14′ x 42′; Francis Deitrich, contractor.

St. Louis.

BUILDING PERMITS. — Eighty permits have been issued since our last report, fourteen of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —

Wm. Gillespie, 3 adjacent two-st'y stores and tenements; cost, $5,000; Eden Reed, contractor.

G. Spengeman, two-st'y store and dwell.; cost, $3,000; G. Spengeman, contractor.

Fred. Hartmann, two-st'y double dwell.; cost, $6,000; Fred. Hartmann, contractor.

Jno. H. Marlsche, two-st'y store and dwell.; cost, $5,5 0; Rothe & Rattermann, contractors.

G. W. Clemens, two-st'y brick dwell.; cost, $9,400; T. B. Annon, architect; W. D. Bartoe, contractor.

J. H. Kaeser, 5 adjacent two-st'y dwells.; cost, $18,000; E. C. Jansten, architect; Paulus & Weidemuller, contractors.

J. Dunlap, two-st'y brick dwell.; cost, $3,500; J. Dunlap, contractor.

G. Rich, 2 adjacent two-st'y dwells.; cost, $5,000; Herman & Schulter, contractors.

F. Hueleman, three-st'y store and dwell.; cost, $5,800; Wm. Kerkenhoff, contractor.

J. Hacker, two-st'y brick tenement; cost, $3,000; J. Hacker, contractor.

G. Keisler, three-st'y brick tenement; cost, $3,600; H. Stevens, contractor.

W. C. Wrisberg, 2 adjacent two-st'y tenements; cost, $2,500; contract sublet.

S. Schultz, two-st'y double brick tenement; cost, $3,000; H. Sudhalter, contractor.

Wm. P. Hourigan, two-st'y brick dwell.; cost, $4,300; W. G. Gaines, architect; T. J. Kelly & Co., contractors.

J. Temple, 4 adjacent two-st'y tenements; cost, $5,400; G. Barnett & Son, architects; M. Kirkwood, contractor.

W. Leo, two-st'y brick dwell.; cost, $3,500; J. Schuster, contractor.

J. Brown, two-st'y brick dwell.; cost, $2,500; Pat. Smith, contractor.

J. W. Clemens, 3 adjacent two-st'y dwells.; cost, $20,000; T. B. Annan, architect; Francisco & Fornum, contractors.

H. Parsons, 2 adjacent two-st'y tenements; cost, $8,000; Rothe & Rattermann, contractors.

T. Higgins, 3 adjacent two-st'y dwells.; cost, $4,000; Furlong, architect; Thos. C. Higgins, contractor.

M. E. Kealmeyer, two-st'y brick dwell.; cost, $3,000; J. Fitzgibbons, contractor.

Miss Margaret Creane, 2 adjacent two-st'y dwells.; cost, $4,430, A. Fenner, contractor.

August Schueddeg, two-st'y store and tenement; cost, $8.500; A. Wieden, contractor.

R. Schegel, two-st'y store and tenement; cost, $3,225; J. Gamache, contractor.

E. F. Hummat, two-st'y brick dwell.; cost, $3,500; M. B. Scanlon, contractor.

G. P. Schaefer, two-st'y brick dwell.; cost, $3,000; J. C. Bockmeier, contractor.

St. Paul, Minn.

Stable.—Two-st'y brick livery-stable, s s of Sixth St., between Jackson and Sibley Sts.; cost, $9,000; owner, Mr. J. T. Alexander.

Building Permits. — Brick veneer store, e s of Dakota St., between Augusta and Morton Sts.; cost, $2,000; owner, John H. Hein.

Alterations to Windsor Hotel; cost, $2,500; owner, John Summers.

Two-st'y frame dwell., e s of Payne Ave., between Wells and Whitall Sts.; cost, $1,500; owner, Nels Olson.

Two-st'y frame double dwell., e s of Burr St., between York and Case Sts.; cost, $2,400; owner, Howard Hill.

Two-st'y frame dwell., n s of Martin St., between Farrington and Elfett Sts.; cost, $2,450; owner, Charles Wick.

Three-st'y pork-packing house, on Eighth St., between Main and Cedar Sts.; cost, $10,000.

Three-st'y stores and dwell., n of Third St., cor. of Oak St.; cost, $13,000; owner, Greenleaf Clark.

General Notes.

Las Vegas Hot Springs, N. M.—J. A. McGringle of Leavenworth, Kans., has the contract for the proposed Montezuma Hotel, which is to be built of red sandstone, rock face, four-st'y; Burnham & Root, architects, Chicago; owners, A. T. S. Railroad Co.

Minneapolis, Minn. — L. M. Lane, two-st'y frame tenement, 3 houses, cor. Third Ave. and Sixth St.; cost, $4,000.

C. M. Loring, alteration of first story and basement of wooden hotel-building to brick, cor. Washington and South Sixth Aves.; cost, $12,000.

J. H. Thompson, double three-st'y brick veneered dwell., s s Linden Ave., between North Fifteenth and Sixteenth Sts.; cost, $8,000.

G. W. Bigley, four-st'y brick store and flats, 126 South Fourth St.; cost, $10,000.

Passaic, N. J.—The Board of Education have adopted the new Hackensack school-house as a model for the new school to be erected in Passaic. It will cost about $20,000.

Superior, Minn. — Church; cost, $15,000; architect, A. M. Radcliff.

COMPETITION.

TORONTO COURT-HOUSE. [At Toronto, Ont.]

City Clerk's Office,
Toronto, Ont., March 4, 1885.

CHANGE OF TIME AND CONDITIONS.

Notice is hereby given that the following amendments have been made to the instructions to Architects previously issued, viz.: —

(1) That the clause providing for the building being erected in Canadian material be struck out.

(2) That all designs for which premiums are awarded shall be and remain the property of the designer, instead of becoming the property of the city, except the one which is accepted for the erection of the building.

(3) That no prize be awarded to any plan the carrying out of which will exceed $200,000.

(4) That the time for the reception of plans be extended **until the 23d of April, 1885.**

JOHN BLEVINS,
481 City Clerk.

CITY-HALL. [At Richmond, Va.]

February 16, 1885.

Proposals are invited **until June 1st, 1885**, for furnishing designs for a city-hall upon which premiums will be paid as follows: —

For first best design, $700.

For second best design, $300.

The Committee on Grounds and Buildings of the City Council reserves the right to reject any and all designs.

For information address the undersigned.

487 W. E. CUTSHAW, City Engineer.

LADIES' COLLEGE. [At Montreal, Can.]

22 St. John Street,
Montreal, February 20, 1885.

The Trustees of the Trafalgar Institute, being desirous of erecting a building for the purposes of a ladies' college, invite architects to submit plans and estimates for the same.

Full particulars as to site, etc., can be had by applying to the undersigned.

Plans, etc., to be submitted **not later than 1st of April next.**

ALEX. F. RIDDELL,
481 Secretary Trafalgar Institute.

PROPOSALS.

IRON GATES. [At Boston, Mass.]

Sealed proposals will be received at the City Architect's office, City-Hall, **until Saturday, March 21st, at 12 M.**, for iron gate for the new head-house, East Boston South Ferry, Boston side.

Proposals from non-residents will not be entertained.

The right reserved to reject any or all proposals received.

For plans, specifications, etc., apply at City Architect's office.

Proposals to be addressed to JAMES SMITH, Chairman Committee Directors East Boston Ferries.

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BRICK, CEMENT, ETC. [N. Y. Harbor.]

Depot Quartermaster's Office,
David's Island, New York Harbor,
March 5, 1885.

Sealed proposals in triplicate, subject to the usual conditions, will be received at this office **until 11 o'clock, A.M., on Wednesday, March 18, 1885**, at which time and place they will be opened in presence of bidders, for furnishing and delivering at this place: —

Granite caps, iron tie rods, bricks and cement.

The Government reserves the right to reject any, or all proposals.

Preference given to articles of domestic production and manufacture, conditions of price and quality being equal, and such preference given to articles of American production and manufacture produced on the Pacific coast to the extent of the consumption required by the public service there.

Blanks and further information furnished by this office on application. GEO. H. COOK,

481 Capt. and Asst. Quartermaster.

SEWER MATERIALS. [At Providence, R. I.]

Board of Public Works,
Office City-Hall,
Providence, R. I., March 5, 1885.

Sealed proposals will be received at this office **until Saturday, the 21st day of March, 1885, at 11 o'clock**, A. M., for furnishing the following-named materials for sewer-work, viz.:

PIPES.

90 feet of fifteen-inch by twelve-inch branch-pipes.
120 feet of fifteen-inch by six-inch branch-pipes.
750 feet of fifteen-inch straight-pipes.
1050 feet of twelve-inch by six-inch branch-pipes.
6000 feet of twelve-inch straight-pipes.
400 feet of eight-inch straight-pipes.
100 pieces double six-inch branch-pipes.
30 fifteen-inch bevel connections.
60 twelve-inch bevel connections.
400 long six-inch bevel connections.
2000 six-inch covers.

INVERT BLOCKS.

1300 eight-inch invert blocks.

FLAG STONES.

100 flag stones for catch basins, five feet by five feet, four inches thick.

CATCH-BASIN STONES.

58 sets side catch-basin stones, one-half right and one-half left.
22 coping stones.

BRICKS.

250,000 hard body bricks.

CEMENT.

The cement required by Sewer Department for the season of 1885.

CHARACTER OF MATERIALS.

The twelve and fifteen-inch pipes are to be in lengths of three feet, of good clay, salt-glazed, uniform in texture and thoroughly burned; eighty per cent of the quantity to be less than one-fourth inch out of round, and less than three-eighths of an inch out of straight; no pipe is to exceed one-half of an inch out of straight or out of round, and in no case is any pipe to be out of round on different diameters at different ends. The glazing and the thickness of pipes to be satisfactory.

The catch-basin, coping and gutter stones are to be of sound, hard granite, and cut according to plans.

The invert blocks are to be salt-glazed clay, of the pattern designed for these works.

The cement to be fresh-burned, well ground, free from lumps, and to stand a tensile strain of not less than sixty pounds per square inch.

The bricks are to be hard-burned, whole and sound, of true form, and with only a small percentage of black ends. Two samples of the bricks offered are to be furnished with the bid, one to be a fair sample of the average quality of the bricks to be delivered, and the other a sample of the poorest bricks that will be accepted.

All materials furnished to be subject to the inspection and approval of the City Engineer.

DELIVERY.

The materials, except catch-basin stones and cement, are to be delivered on wharf occupied by the city, foot of Point St. The catch-basin stones may be delivered either on the wharf occupied by the city, or on cars at the city yard.

The delivery of all materials is to begin or or before May 1, 1885, and to be completed or or before August 1, 1885, except the cement, which is to be delivered on the street as the work in progress requires.

A bond satisfactory to the Board for a sum equal to about one-tenth of the estimated amount of the contract, as liquidated damages for failure to execute the contract within ten days, if awarded, must accompany each proposal.

A bond satisfactory to the Board for a sum equal to about one-third of the estimated amount of the contract, conditioned upon the faithful performance of the contract, will be required of the successful bidder.

The Board reserve the right to reject any or all proposals.

CHAS. E. CARPENTER, CLINTON D. SELLEW, Board of Public Works.

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PROPOSALS.

EXTENSION OF TIME.

Office of the Light-House Board,
Treasury Department,
Washington, D. C., March 5, 1885.

THE date of opening the bids for the metal-work of the Rebecca Shoal Light-House is hereby changed to **Saturday, March 21, 1885**, instead of March 11, as heretofore advertised. S. C. ROWAN,
Vice-Admiral, U. S. N.
481 Chairman.

JAIL AND SHERIFF'S RESIDENCE. [At Delhi, N. Y.]

Delhi, Delaware County, March 3, 1885.

Sealed proposals for the erection and completion of a jail and sheriff's residence at Delhi, Delaware Co., N. Y., will be received **until Tuesday, March 24, 1885, at 7 o'clock, P. M.**, by the undersigned Committee, at the office of Abram C. Crosby, in Delhi, aforesaid.

The plans, detail drawings and specifications for said building can be examined at said office, or a copy of the specifications will be furnished on application to either member of said Committee.

Proposals will be received as follows, namely: —

First, for the entire erection and completion of said jail and residence, including plumbing, cesspools, and everything mentioned and implied in said plans, detail drawings and specifications.

Second, for the erection and completion of the Sheriff's residence, in accordance with said plans, detail drawings and separate specifications therefor.

Third, for the erection and completion of the jail in accordance with said plans, detail drawings, and separate specifications therefor.

Fourth, for the complete plumbing of said residence and jail, excavating for cesspools and trenches for pipes, and furnishing material, in accordance with the plans, detail drawings and separate specifications therefor.

The bidder whose proposal shall be accepted for the construction of either the entire building, or for the residence, jail or plumbing separately, before entering into a contract therefor with said Committee, will be required to give a bond with sufficient surety or sureties for one-third the amount of his bid, conditioned for the faithful performance of his agreements in said contract. The name or names of his proposed surety or sureties must accompany his bid.

The Committee reserve the right to reject any or all bids.

ABRAM C. CROSBY,
GEO. O. MEAD,
J. M. DONNELLY,
482 Building Committee.

ELEVATORS. [At Cincinnati, O.]

Office of Supervising Architect,
Treasury Department,
Washington, D. C., February 28, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 28th day of March, 1885**, for furnishing and erecting complete, in the custom-house and post-office building at Cincinnati, O., two hydraulic passenger-elevators, two mail-elevators, and one ash-lift, in accordance with drawings and specification, copies of which and any additional information may be had on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check for $1,000, drawn to the order of the Secretary of the Treasury, as a guarantee that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered. M. E. BELL,
481 Supervising Architect.

EXCAVATING, CONCRETE FOUNDATIONS, BRICKWORK, ETC. [At Shreveport, La.]

Office of Supervising Architect,
Treasury Department,
Washington, D. C., February 25, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 11th day of April, 1885**, for furnishing all labor and material required for the excavating, the concrete foundations, and the brick and stone work of basement and superstructure of the post-office, court-house, etc., building at Shreveport, La., in accordance with the drawings and specification, copies of which may be seen and any additional information obtained at this office or the office of the superintendent.

Bids must be accompanied by a certified check for $1,000, drawn to the order of the Secretary of the Treasury, as a guarantee that the bidder will enter into a contract if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered. M. E. BELL,
481 Supervising Architect.

ELEVATORS. [At Kansas City, Mo., Memphis, Tenn., and Montgomery, Ala.]

Office of Supervising Architect,
Treasury Department,
Washington, D. C., March 3, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 31st day of March, 1885**, for furnishing and erecting complete, a steam passenger elevator in the new public buildings in each of the *above-named cities*, in accordance with drawings and specification, copies of which and any additional information may be had at this office or the office of the superintendent at each building.

Bids must be accompanied by a certified check for $1,000, drawn to the order of the "Secretary of the Treasury," as a guaranty that the bidder will enter into a contract if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received *after* the time of opening will *not* be considered. M. E. BELL
481 Supervising Architect.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS.

WE are much pleased to find that the experiment we hope to make in the competition for the Richmond City-Hall meets with the approval of architects of the most varied attainments in all parts of the country, and we hope that this simple announcement will cause any architect who may have hesitated to declare himself in favor of the experiment, through fear he might not find himself in just the company he would prefer, to join the movement and lead him to swell, by his own modest contribution, the fund collecting in our hands. To show the spirit in which our proposition has already been met, we select from the many letters before us that of Mr. William A. Potter, late Supervising Architect of the Treasury Department, as coming from a man thoroughly well known and respected. Mr. Potter, at the time of forwarding his contribution to the fund, writes thus: "Your idea must strike any architect who has given any thought to this knotty subject, as it strikes me, as most admirable. . . . Whether I am selected [as one of the 'champions'] or not, pray be assured of my hearty sympathy with you in this movement, and of my earnest wish for your success; for, succeeding, you could render no greater service to the profession." Such endorsements as these — for this is but one of many — ought to convince doubters that the experiment is worth trying, and induce them to join in making the movement the act of every architect in the country. We earnestly ask the active co-operation of all architectural associations, as well as of all public-spirited individuals.

WE have opened the first parallel of our attack on Richmond by explaining the details of our scheme to the city engineer who issues the programme, and asking him to urge the proper authorities to allow the experiment to have a fair trial, and have suggested that the present programme be cancelled as soon as possible, and a new one issued which shall embody the following points: The date to be extended to August 1; the award to be made under the advice of three architects, appointed, one by the city, one by the competitors, and the third by these two, these experts to act with the city's committee; the successful architect to be assured the execution of the building at the regular commission, and the prizes now offered to be awarded to the second and third designs; the awards to be made absolutely and without reservation; with the exception of the prize designs all designs to be returned as soon as a decision has been reached; all designs, rendered in ink only, to be submitted anonymously. If we had supposed the authorities would endure a further delay we would have suggested a preliminary and a final competition, but we understand that from their point of view we have already asked more than they can see the wisdom of conceding. Still, if they will only make these concessions, present indications seem to justify us in promising them that they will receive not only better designs but more of them; while to competitors by the same concessions, if fulfilled to the letter and in the spirit they imply, a perfectly fair and honorable public competition seems to be assured.

THE *Scientific American* gives some statistics in regard to the dimensions of the buildings erected for the New Orleans Cotton Exhibition, which may surprise those who imagine that New Orleans is a poor provincial town. There are thirty-six buildings, large and small, in the exhibition grounds, devoted solely to its purposes, besides ten private structures, and the whole area roofed in is two million eight hundred and twenty thousand square feet, or nearly sixty-seven acres. The Main Building covers one million six hundred and fifty-six thousand square feet, or nearly forty acres. This is about double the space covered by the Main Building at Philadelphia; and the New Orleans building must be one of the most imposing architectural objects ever erected, so far as size and multiplicity of parts can give that distinction. Besides this huge structure, the State and Federal Governments have a building to themselves, covering about six hundred and forty-nine thousand square feet; and the famous Horticultural Hall occupies one hundred and sixteen thousand more. The aggregate of motive power required for driving the machinery on exhibition is said to be the largest ever collected in one place, amounting to five thousand nine hundred and thirty-seven horse-power. This is the more remarkable on account of the situation of New Orleans, which, as the metropolis of a farming and planting region, would hardly be expected to compete in exhibits of machinery with Philadelphia, the centre of the manufacturing interests of the continent. Large as the buildings are, they are filled with exhibits, and twelve hundred applications for space are said to have been rejected after the whole available area had been taken up.

TWO manufacturing towns of considerable importance in Massachusetts have recently entered into a discussion of systems of sewerage suitable for their needs, and in respect to the final disposition of the sewage both have come to the same conclusion, that the application of the liquid to land by irrigation presents more advantages, and fewer disadvantages, than any other method of disposal. One of the towns, Marlborough, has had a report prepared by Mr. E. S. Philbrick, one of the most experienced and cool-headed engineers in the country, which recommends the purchase of about one hundred acres of land, and the utilization of the sewage upon it for the growth of fodder grasses, or similar crops. The cost of the system of sewers, with that of the outfall mains, and the land for treatment, is estimated in the report at one hundred and thirty-five thousand dollars. We have not the details of the scheme, but this seems a small price to pay for anything like a complete system of drainage disposal for a considerable town, and, judging from the experience of Pullman, it is not too much to hope that some return on the investment may be made from the profits of the farm. There is one great advantage about irrigation as a mode of sewage disposal for small interior cities, — that as land suitable for utilization is always to be found within a short distance of the centre of the town, and at a reasonable price, the problem of conveying the collected sewage to the outfall, which is often by far the most difficult and costly portion of the whole work, is reduced to an insignificant matter; and the land purchased for irrigation, although representing a comparatively large investment of money, can always be sold again, if the experiment should be abandoned, at something like the cost, and often at a very great profit; while an abandoned and ruined outfall sewer is without value to anybody.

SOME of our readers may perhaps like to try experiments with a very simple sort of photolithographic process, which we find described in *Le Génie Civil*. As every one knows, all photolithographic processes, as well as those for producing relief-plates by the action of light, are founded on the property which is possessed by bichromate of potash, of combining with gelatine or albumen, under the influence of light, in such a way as to render it insoluble in water. As all amateur photographers with a taste for investigation soon learn, bichromate of potash is acted upon very strongly by light, and in ways which have as yet been but imperfectly investigated, the coagulation of albumen being only one of the phenomena which it exhibits under solar influence; so that experiments with it have an interest which hardly attaches to those with the silver compounds. To apply it to photolithography in the simplest form, the easiest method is to procure sheets of ordinary

albumen paper, and sensitize them by floating them, with the albuminized surface upward, for three minutes, on a bath of bichromate of potash solution, formed with three parts of the salt to one hundred of water; or, if more convenient, by laying them, with the albuminized surface downward, on a clean sheet of glass, and brushing the back liberally with the bichromate solution; taking care in either case not to allow the solution to run over the side coated with albumen, which it would dissolve away. The ordinary albuminized paper is quite spongy, and soon takes up enough of the bichromate solution through the back to bring the albumen into the necessary condition without injuring the surface. As soon as the sheet is evenly saturated with the solution it is hung up and thoroughly dried.

To prepare a plate for printing by means of this paper, a sheet is placed under a negative in the usual way, and exposed to the sun during such time as experience may show to be suitable. The paper is then taken out of the frame, laid, face upward, on a sheet of glass, taking care to hold the edges down in some way, and the whole covered, by means of a roller, with lithographic transfer ink, until it is uniformly black. The sheet is then immersed in cold water, which gradually dissolves the portions of the albumen surface which have not been acted upon by the light, and loosens the coating of ink over those portions, allowing it to float away, while the ink over the places which the light has touched remains firmly attached to the albumen there coagulated and rendered insoluble. The process of soaking off the unchanged albumen, and disengaging the picture, is rather a long one, but it can only be hastened by brushing away the loose ink at the risk either of smearing the picture, or of rubbing out the finer lines. The next step is to transfer the paper proof to the lithographic block, which is usually a sheet of zinc, in place of a stone. The zinc plate is prepared for the transfer by vigorous rubbing with a hard brush and a ten per cent solution of sulphuric acid, followed by polishing with pumice-stone, a dip into a three per cent solution of nitric acid, and a final washing with clear water. The paper proof, which has been kept between two sheets of wet blotting-paper, is then laid face downward on the zinc plate, and pressed firmly two or three times under the lithographic press. If this is properly done, the picture is transferred to the zinc; but before printing from the plate it is necessary to treat it with a decoction of gall-nuts, slightly acidified with nitric acid, which turns the zinc, between the ink lines, to a bluish color, and gives it the property of repelling the greasy lithographic ink. The plate is then ready for use, and as many impressions as necessary may be taken from it.

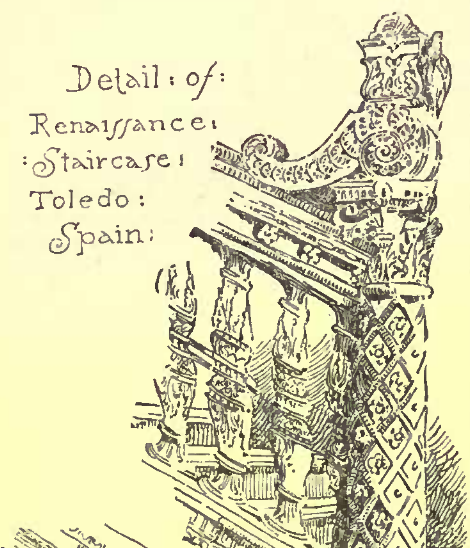
Another process, by which tracings, or transparent drawings can be transferred by the action of light directly upon the zinc plate, without the intervention of a negative, or of any bichromate of potash or albumen, employs bitumen of Judea as the sensitive agent. The zinc plate, after cleaning and polishing, is treated with the gallic-acid solution mentioned above, which, to be more exact, is made by boiling two hundred and fifty parts by weight of pulverized gall-nuts in five thousand parts of water, until the whole is reduced to two-thirds the original bulk, filtering through cloth, and adding fifty parts of nitric acid, and three parts of chlorohydric acid. This solution gives to the whole of the zinc plate the property of repelling lithographic ink; but this property may be removed by acetic acid, and on this action of acetic acid the process depends. To render the plate sensitive, it is covered with a thin varnish of bitumen of Judea dissolved in naphtha, at the rate of one part of bitumen to twenty-five of naphtha, which is allowed to dry. The tracing to be copied is then laid on the plate and exposed to the light, which renders the bituminous varnish insoluble in spirits of turpentine, except where shaded by the lines of the tracing. It is then necessary to immerse the plate in spirits of turpentine, which dissolves the varnish from the lines of the picture, and exposes the metal in those places. After washing off the turpentine with water, a solution of five parts of acetic acid in six parts of water is applied to the plate, which, reaching the metal through the lines left bare by the solution in the turpentine of the varnish over them, renders it in those places capable of retaining the oily lithographic ink. Another washing with water is followed by the removal of the whole of the varnish with naphtha, and the plate is then ready for the press, the lines acted upon by the acetic acid being the only portions which will retain the ink from the roller.

The Société Industrielle de Mulhouse in Alsace offers for this year thirteen medals and prizes for essays and inventions of various kinds, many of which are to have some relation to the improvement of the condition of the working-people for whom this renowned society has done so much. The first prize, of five hundred francs and a medal of honor, is offered for plans for working-men's houses superior in convenience and economy of construction to those hitherto in use; and three other medals and prizes are assigned as rewards for the invention of devices for guarding workmen against accidents caused by machinery in motion, by belts and shafts, and by circular or band saws. The apparatus which, it is hoped, may be invented for the latter purpose is described as a "pusher," to be held in the workman's hand, and used to guide the wood to be cut against the teeth of the saw. It is obvious that such a utensil must be very manageable and flexible to take the place of the delicate and nervous human hand, but so many scores of men are every year maimed by the slipping of a bit of wood, the deviation of a saw-blade, or an incautious movement, that a practicable method of obviating the risks from such occurrences would be of inestimable value. Another medal is offered for an invention for the automatic feeding of steam-boiler furnaces, probably with the charitable intention of releasing for higher uses the men now engaged in this exhausting and unintellectual occupation. Under the head of hygiene, a medal is offered for the best essay setting forth in a striking and effective manner the evil influences of alcoholic drinks; and under "fine arts" a medal and prize are offered for essays on the practical utility of a knowledge of drawing in the manual professions, and on the best modern methods for imparting that knowledge.

We suppose that most of our readers know something of the operation of extracting gold from the ore, and will be glad to learn that a process has been recently invented which has proved far more successful than any hitherto in use for preventing the waste of gold, amounting usually to about one-half of the whole quantity contained in the ore, which takes place under the old methods in the process of extraction. As every one knows, most of the gold now obtained is found in slender veins or specks in a matrix of hard quartz. To separate the small particles of metal from the matrix, the quartz rock is pulverized in a stamp mill, which reduces it to a powder fine enough to pass through a sieve having two hundred and twenty-five meshes to the square inch. This coarse powder, which is kept wet in the stamp mill, is then intimately mixed with mercury, which dissolves out the gold and silver from the mass. The mercury having the metals in solution is then separated from the quartz dust, which is thrown away, and by distilling off the mercury the gold or silver is recovered in a pure state. The principal defect of this method is that the powder of the ore is not fine enough to yield up all its gold to the amalgamating mercury, and much of the precious metal, contained in tiny points embedded in the midst of the coarser quartz particles, is entirely lost. The new process, therefore, improves upon the old especially in this particular, and, by means of a different method of pulverization, obtains a powder fine enough to pass through a sieve of eighty-one hundred meshes to the square inch. No water is used, as with the stamp mills, and the mixing of the fine powder with mercury is thus rendered much easier than the old form of amalgamation, which was often seriously checked by the "killing" of the mercury by the water. The presentation of the powdered ore to the mercury is made in an ingenious way, by throwing the dust by centrifugal force into the bottom of a cylinder thirty inches high, filled with hot mercury. The ore floats on mercury, and rises to the top, the metal contained in it combining with the liquid on the way. When the dust reaches the surface it is subjected to the action of a strong current of air which blows it into a long shaft. Here it separates, the lighter particles, which contain no gold, being blown entirely out of the building, while those to which gold clings, as well as particles of pure gold, amalgamated by the mercury, but not dissolved, fall into boxes prepared for them. According to *Le Génie Civil*, all the gold and silver in the ore is by this process saved, while the cost is no greater than that of the old process, the new pulverizers reducing the ore to a fineness forty times greater than that obtained by means of stamp-mills, at about four-fifths the cost.

PARIS CHURCHES.

ST. EUSTACHE.



ST. EUSTACHE, though by no means one of the oldest of the Paris churches, is, after Notre Dame, the largest. In plan, arrangement and size it is Gothic in style, but all its details are Renaissance. It has double aisles, octagonal shafts with Classical pilasters, round-headed arches, and curvilinear tracery. It was commenced in 1532 and finished in 1641, the original plan having been carried out in most of the details. But tradition gives a much earlier date for the original church, which was dedicated to St. Agnes, the co-patroness of the present church. It appears a chapel was erected here at a very early date, upon the site of a temple consecrated to the goddess Cybele — l'abbé Le Beuf says in 1200, but he does not mention a quaint account of its origin, which is recorded by Gilles Corrozet, the first of the Paris historians. "A certain *bourgeois* named Jean Alais, in consideration of his help in financial matters, obtained from the king the right to levy a tax of a penny upon every basket of fish sold in the Halles. Remorse overtaking this publican, he obtained the revocation of the tax; but the victims gained nothing by the repentance, as another was allowed the same privilege. Thereupon Jean Alais founded a chapel in expiation of his sin, and, dying, begged to be buried therein. A stone was placed hard by, which, becoming a stepping-stone for passengers in rainy weather, acquired the name of Pont-Alais."

Thus the legend; but the chapel is mentioned in authentic documents in 1213, when it was said to be situated on the ground belonging to St. Germain l'Auxerrois, at a little distance from the cemetery of the Holy Innocents, and on the road to Montmartre. In 1223 it is mentioned in a charter as the church of St. Eustache. L'abbé Le Beuf mentions that, in consequence of the increase of the population at that time, it was enlarged and almost entirely rebuilt, but no accounts remain of this first structure. In 1429 the high altar was advanced, and that of St. Gregory destroyed, to make a passage to the crypt of St. Agnes, which still exists as a cellar to a neighboring fruiterer, but which the clergy hope to acquire the possession of, as soon as the lease runs out. The last mention of the old church was in 1495. The only reason for joining the name of St. Eustache to that of St. Agnes as patron seems to have been the translating of some relics of the sainted hunter, preserved at St. Denis to this church.

St. Eustace was a Roman soldier and captain of the guards of the Emperor Trajan. His name in early life was Placidus, and he had a beautiful wife and two fine sons. He lived in great style, practised all the heathen virtues, notably those of charity and loyalty, and was not only a great warrior but withal a great huntsman. Now it happened one day, while hunting in the forest, that a beautiful white stag appeared before him, having a cross of radiant light between its horns, and on the cross an image of the Redeemer. Being astonished and dazzled by the vision, he fell upon his knees, and lo! a voice came from the cross and cried to him: "Placidus, why pursuest thou Me? I am Christ, and thou hast hitherto served Me without knowing Me? Dost thou now believe?" And Placidus fell with his face upon the ground and said, "Lord, I believe!" And then the voice said: "Thou shalt suffer much for My sake, but I will not forsake thee." Then replied Placidus, "Lord, I am content; do Thou but give me the patience to suffer." Then he arose and returned to his wife, and next day he and his family were baptised, he taking the name of Eustace. Then came tribulations and sorrows. He lost his possessions by robbers; pirates carried away his wife; and one day, in crossing a river, having first carried over one child and laid it on the bank, to fetch the other, a wolf seized it, and turning round, he saw a lion carry off the other. And so being weary and sad, he prayed for resignation, and abode in a village quietly and unknown for the space of fifteen years. But when the Emperor Adrian came to the throne, he sent out messengers to search for him far and near, and at last they found him, and he was restored to all his former honors. But his heart was sad for the loss of his wife and children. . . . Meanwhile his sons had been rescued from the jaws of the wild beasts, and after many years both they and his wife were restored to him, and his heart was exceeding glad, and he thought all his sorrows at an end. But it was not so, for the Emperor desired a great sacrince to be made to the gods, in consequence of a mighty victory he had gained over the barbarians, and Eustace and his family refusing to offer incense, they were shut up in a brazen bull, and a fire being kindled under it, they all perished together.

The legend of St. Agnes is too long to relate here, and doubtless is known to most persons. It is one of the oldest and one of the most authentic. St. Jerome, writing in the fourth century, tells us that in his time the fame of this childish saint was spread through all nations, and that homilies and hymns in her honor abounded. There is a charm in most of the legends of the Christian saints and martyrs, but in none of them more than in that of St. Agnes. Her youth (she is supposed to have been but thirteen years of age), her beauty, her innocence and her courage have invested her with an interest and a vitality which is second to that of no saint. But why the church we are considering was dedicated to her, we have no means of knowing.

The first stone of the present edifice was laid by Jean de la Barre in 1532. Le Beuf gives Charles David as the name of the architect. Certainly there was an architect of that name whose epitaph records that he superintended the works of the church. But as he died in 1650, at the age of ninety-eight, he could only have been born in 1552; the church was therefore begun twenty years before his birth, and he could only have carried out the designs of a predecessor. Some persons think this may have been Dominico da Cortona (Boccadoro), the architect of part of the Hôtel de Ville, and certainly there are portions of the church which recall some of the details of Boccadoro's façade. It is curious that a few years after the church was finished its "barbarous style was said to shock peoples' eyes," and consequently the west door was demolished and the present clumsy, semi-Classical one erected in its stead by Mansard de Jouy, in imitation of the façade of St. Sulpice. Happily the rest of the church being finished, it was left as it was. There is an old engraving of the original west front, and it is hoped by many that a restoration may before long take place, the intention being to demolish the present incongruous masonry and put it up in some more suitable position, as for instance at St. Nicholas du Chardonnet, in the Rue Monge, a church which has no principal entrance. When Mansard erected the present west end he destroyed two chapels which had been decorated, at Colbert's expense, by Mignard, and Lafosse, a pupil of Le Brun's, thus reducing the length of the nave, and so giving cause for the objection many persons make to the proportions of the church — that it is too high for its length.

Formerly St. Eustache was a royal parish, and in its neighborhood lived many of the nobility. Cardinal Richelieu inhabited the Palais Cardinal, now the Palais Royal; Cardinal Mazarin had a hôtel in the Rue Neuve-des-Petits Champs; and the Duc d'Epernon in the Rue Platrière, since called Jean-Jacques-Rousseau, after the poet, who lived on the fourth story of No. 49. The *curés* were often cited to preach before royalty, and one Jean Lecoq seems to have been so influenced by the Reformed doctrines that François I was thereby somewhat disturbed in his mind, until reassured by the Cardinals de Lorraine and de Tournon. Another *curé*, René Benoist, was a celebrated preacher during the League. Arriving quite young in Paris, he was received into a theological school called the Société Royale de Navarre. He became Mary Stuart's confessor, and followed her to Scotland after the death of her husband, François II. After his return to France he became *curé* of St. Pierre des Arcis, and subsequently of St. Eustache. Being favorable to the League, he was surnamed by that party the *Roi des Halles*, and upon the assassination of the Guises at Blois, he made a sort of funeral oration; but when the party gave way to excesses he abandoned it, and thereby called down their vengeance, and was renamed the *Diable des Halles*. He was present at the abjuration of Protestantism by Henry IV, at St. Denis, and was appointed subsequently to the bishopric of Troyes. On the death of the successor of Jean Benoist, a tumult seems to have arisen, caused by the nomination of a stranger to the *cure*, instead of the late *curé's* nephew. The whole population of the quarter rose up in anger, put the soldiers to flight, and installed their pet pastor. The disorder lasted three days, and a deputation of the Dames de la Halle interviewed the queen upon the subject. The speech of the leader is curious. She points out that the late curate was so good, that having on his death-bed designated his nephew as his successor, it is not fair to give us another. "*Les Marlin, voyez-vous, depuis bien longtemps, sont curés de St. Eustache, de père en fils, et les paroissiens n'en souffriront pas d'autre.*" The queen gave an evasive answer and the tumult continued, even to the putting up of barricades. However, the archbishop gave way after a time, and Marlin succeeded his uncle amidst cries of "*Vive le Archevêque!*" and "*Vive la Reine!*" but what was perhaps more significant was the placarding of the church with the following notice: "*Avis. Le Curé de St. Eustache est â la nomination des Dames de la Halle.*" The importance of these ladies is as great now as in the seventeenth century, for during the Commune, when Archbishop Darboy, l'abbé Duguerry and other priests were taken prisoners, the *curé* of St. Eustache, l'abbé Simon, owed his safety to les Dames, who faced the insurgent authorities and commanded his release.

Louis XIV made his first communion at this church, and Madame d'Aubigné (afterwards Mme. de Maintenon) was in the habit of attending matins here at two o'clock in the morning. Degenerate times these! When does one hear matins at all? Certainly not at 2 A. M. A grand funeral oration was delivered here in honor of Anne of Austria, by Père Senault, and ten years later the king and all the court were present at another in glorification of Turenne. Fléchier was then the preacher, and no words seem too great to sound his praises as a soldier, a man and a Christian. A curious anecdote is told of Massillon, who often preached at St. Eustache. In 1704 he delivered his celebrated sermon upon "the small number of the elect," and when he pronounced the sentence of the Sovereign Judge, so great was the effect that the whole congregation arose, stricken with terror. The Fête Dieu (Corpus Christi) processions were very magnificent. An account of one during the minority of Louis XV (now preserved in the archives) gives a list of lacqueys with torches, footmen, pages, the preceptor of the Duc d'Orléans's pages, régent "in long robe and surplice," banners of confraternities, Swiss, drummers, the clergy, and immediately thereafter the dais covering the Blessed Sacrament, the Duc d'Orléans bearing a taper, followed by his carriage, his servants, soldiers, etc.

Every year the "*reposoir*" in the Palais Royal attracted all Paris. In 1836 it was constructed from drawings by the Italian Servandoni, the architect of St. Sulpice. In 1791 Mirabeau's body was placed here for a time and an oration pronounced over it by Cerutti; in the evening it was transferred to St. Geneviève (Panthéon). A feminine club was established here during the Revolution, but so great were the excesses practised that the Comité de Salut Public closed it. In 1793 the fête of the goddess of Reason was celebrated here, as at Notre Dame. The interior of the church was converted into a representation of the country, with here and there cottages, and little paths leading to them through ravines and grottos. Tables full of viands and drinks were placed all round the choir, and every kind of vice reigned supreme. The high altar, partly composed of porphyry and gold columns, the bronze statues, the pulpit, the pictures, the tombs, all that was artistic and destroyable was destroyed; but in 1795 the church was partly restored to its proper uses, although at first the *curé*, l'abbé Poupart, was compelled to share it with the theophilanthropists and municipal councillors. Pope Pius VII visited St. Eustache and was present at a mass which was rendered as grand as music and ceremonial could make it, and blessed the new statue of the Blessed Virgin, the work of the sculptor Pigalle.

Amongst the persons buried in St. Eustace are many artists and musicians, Rousseau, Lafosse and others; Colbert, also, whose tomb is intact. Molière and La Fontaine were buried in the parish cemetery, now the Marché St. Joseph. Molière was born in the parish, near the corner of the Rues St. Honoré and Pont-Neuf.

The exterior of the church is a fine example of the Renaissance style of François I, and the south door is particularly rich in detail. The voussoir contains niches for fifty statuettes. Above the doorway are two rows of galleries surmounted by a rose-window, and crowned by two turrets on each side of the pointed roof. In the intersection of the cross is a lantern supporting a light, elegant little *flèche* containing the bell. Flying-buttresses, springing from the exterior walls, support the nave, apse and transepts. At the east end is a *chevet*. All this end was terribly knocked about during the Commune, and the clock-tower had a narrow escape from complete destruction. Curiously enough the bell of the clock had been allowed to remain by the first revolutionists, for its utility. The north door was not constructed until 1640, and is very inferior in style. Some statues have lately been placed there during the restorations after the Commune.

The effect of the interior of the church is grand in the extreme, particularly on any great festival, or during the evening services of the Fête Dieu, when the entire east end is ablaze with candles. It is three hundred and forty-one feet long by one hundred and nine feet high, and has double aisles, out of which open numerous chapels. The shafts are octagonal and the roof is groined. Above the triforium is a clerestory filled with stained-glass by Cartaux. The *banc d'œuvre* (seat for clergy and assistants during sermon) is a fine specimen of wood-carving. It is in the form of a Greek portico supported by Ionic columns, and ornamented with figures of St. Agnes and angels. Its preservation during the first revolution was due to the accident that above the medallion at the back is a Roman fascine, crowned by laurel leaves, which, being a republican symbol, saved the entire work from destruction. It was carved by Lepautre, from designs by Cartaux. The pupit is modern, replacing the original, which was designed by LeBrun. The organ, re-erected in 1854, is very fine, and its case a real work of art. It is ornamented with heads of cherubim, and statues of David, Saul, and St. Cecilia, by M. Guillaume, the eminent sculptor. The sanctuary is paved with colored marbles in geometrical patterns, which were laid some few years ago; but the wood-work of the stalls is old, bought in 1795, for five thousand francs, and formerly in the Convent of Picpus. The altar is of Paros marble, designed by M. Baltard, and though not of the best proportions, is fine in general effect. Before the Revolution there was a reredos of stone said to have been sculptured by Daniele da Volterra. This bas-relief is now in the Renaissance museum of the Louvre.

All the east end as far up as the triforium has been repainted, in accordance with the original design, and the general effect is peculiarly rich. Some of the frescoes are by the seventeenth-century painters, but most of them are modern, those in the chapel of St. Andrew being the work of Theodore Pils. At the side of the Lady Chapel is a charming staircase leading up to the Chapelle des Catéchismes, with a handsome balustrade of wrought-iron, of the reign of Louis XVI. The Chapel of St. Louis of Gonzague (entered by an equally fine iron *grille* of the same period) contains a fine statue of Colbert, from designs by Le Brun. It is a black marble sarcophagus, upon which the minister kneels, with clasped hands, and vested in the rich costume of the order of the Holy Ghost. At the foot of the monument are sitting figures of Religion and Abundance. Religion was the work of Tuby, but the other figures are by Coysevox. The expression of the face of Colbert is fine, and the hands and drapery exquisitely modelled. During the Revolution the monument was transported to the Petits-Augustins Museum, but in 1801 it was restored to St. Eustache. A confessional of the period of Louis XV, in the Chapel of the Magdalen, should not be passed over. The frescoes in this and the Chapel of St. Vincent de Paul are attributed to Simon Vouet and his pupils; they bear the date, 1634. The gallery above the sacristy door is fine Louis XVI work.

Amongst the treasures of St. Eustache are an ivory crucifix in the sacristy; a bone of the patron saint, given in 1660 by Pope Alexander VII to Sieur Chauvin; a tooth, formerly in the church of St. Jacques-l'Hôpital; and some bones and linen formerly enveloping the relics. A curious manuscript in the possession of M. Boblet records a list of masses to be said in the church, and amongst them one called the *pie voleuse*, which was to be celebrated every day, at four o'clock in the morning, for the repose of the soul of the poor serving-maid who was unjustly accused of stealing the spoon which was afterwards found in the roof of the church, carefully placed there by the wicked magpie. Surely the guilty bird and not the innocent maid ought to have been the object of the prayers. So much has been said against the Communists (and with justice) that a trait in their favor ought to be related. The day the l'abbé Simon was arrested he had three thousand francs in his pocket, which were destined to pay for the marble pavement of the choir. Of course upon his arrival at the prison they were given up to the police, and were not restored when the *curé* was released. On Easter-Monday, however, Raoul Rigault's secretary went to the sacristy, asked M. Simon if the money had been returned, and finding that it had not, he left the church, to return in an hour's time, with the three thousand francs intact.

No one should omit visiting St. Eustache on St. Cecilia's day (November 22), when a grand mass is always performed, with full orchestra, in aid of the Society of Musicians; and indeed any Sunday the music is quite well worth hearing, and the ceremonial is the finest in Paris. At the same time much has been lost by the substitution of the Roman for the Parisian rite, which took place in 1876. In the former, two acolytes swing censers; in the latter, four or six acolytes threw them up high five times, the sixth time catching them while kneeling on one knee. The grand effect of this ceremony can never be forgotten by those who saw it. St. Eustache has also been shorn of some of its interest by the death, some few years ago, of its great organist, M. Batiste. Perhaps no one has ever brought sweeter sounds out of an instrument, and certainly no one's playing was ever so pathetic and touching as M Batiste's. The organ has four manuals, four thousand three hundred and fifty-six pipes, seventy-eight stops, and twenty composition pedals. In the south transept is a little Gothic statue of St. John, and on the wall is a sad memorial of the names of all the hostages who suffered death under the Commune, headed by the Archbishop (Darboy), the *curé* of the Madeleine, Duguerry (formerly *curé* of St. Eustache), and the abbé Simon. Some of the glass dates from 1631, but it is not remarkable for beauty.

S. Beale.

Deterioration of Paintings in the Louvre Galleries. — A sad discovery has been made in the Louvre gallery by M. Gruyer, the curator of the painting department. It seems that upwards of sixty canvases, including works by Rubens, Scheffer, Prud'hon, Gérard, Flandrin, Mignard, Lesueur, Delacroix, Rigaud, Patel, Hein, and other masters, are seriously, some of them irretrievably, injured by either moisture, dust, and the hot-air furnaces, combined with defective ventilation. — *American Register, Paris.*

Brick-boring Bees. —A curious discovery was made at the Brighton Railway Works on Thursday last during the removal of an old wall. In the midst of some of the bricks were found some bees, lodged in compact cells; and, as the wall had been known to be in existence for about forty years, it was assumed that these bees had remained in their prison during that long period, just in the same way as a toad is popularly accredited with being able to exist in a stone for an indefinite number of years. Some of the bees and a couple of pieces of brick containing their cells were shown to the members of the Brighton and Sussex Natural History Society on Thursday evening by Mr. B. Lomax, who explained that the curious insects, which were rather smaller than a bumble bee, were what was known as "boring bees." They had, in fact, the power of excavating a cell in a brick, and then, after lining it with a kind of mortar, of closing up the hole communicating with the outside with a clay made of the brick-dust, in such a manner as to leave little or no trace outside of any aperture having been made. This work was performed by the female bee, who, after depositing an egg in a cell, with some honey, closed it up after her in the manner indicated, leaving the young bee in due course to cut its way out. — *Timber Trades Journal.*

THE PLANTIN-MORETUS MANSION, ANTWERP.



NICHE, CHURCH LA DALBADE TOULOUSE, FRANCE. XVI CENTURY.

BELGIUM is full of good, typical examples of late Gothic and early Renaissance architecture, both religious and civil in character, but the remaining specimens of domestic architecture are so few in number that they are mostly regarded in the light of monuments, and are cared for by the Government accordingly. Aside from the old Bishop's palace at Liège, which really partakes more of the nature of a public building than a bishop's residence, probably the best example of sixteenth-century Belgian private architecture is found in the Plantin-Moretus mansion, in Antwerp, which was built about 1575, for a printer named Christopher Plantin, a man apparently of a busy, pushing disposition, who accumulated a large fortune in his business, being greatly helped thereto by valuable monopolies granted him from the then all-powerful Spanish crown, to print the Bibles and prayer-books for use throughout the country. Those were the days of the great trade guilds, when a man's best title to consideration was success in business, and we find the old printer occupying a high place in the municipal affairs, and forming connections in the highest quarters. On his death, he was buried in the aristocratic church of St. Jacques, the family monument commemorating his name and virtues having been designed by Rubens, as an inscription testifies. His son-in-law, Moretus, succeeded to the business, which was carried on in the family mansion by himself and his descendants until as late as 1800, when the establishment lost some of its most valuable privileges, and the business dying out, the house remained almost unoccupied for nearly seventy-five years. The city government finally purchased the entire property, including the furniture, pictures, and printing appliances. The premises have been carefully restored, and as most of the fittings date from the sixteenth century, the house can now be said to present about the appearance it did in the time of Christopher Plantin. It is open to public inspection as a museum, and is as interesting and true a type of its kind as can be found anywhere. At the time it was built, Antwerp ranked second to hardly any city in Europe, and the excellence of the public taste of the period is shown by the rich Flemish tapestries, the fine carvings, and the stamped Spanish leather which were so freely used throughout the house. There are also preserved some ninety family portraits, mostly executed during the best period of Flemish art, including a number by Rubens and Van Dyck.

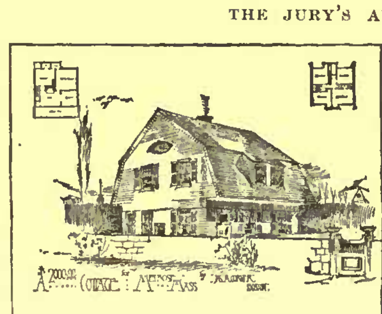
In looking over the house it is interesting to note how little some ideas of domestic architecture have changed during the past three centuries, or to speak more properly, how modern ideas have returned to old standards. Nearly all of the finish in the Plantin-Moretus mansion could be copied exactly in a Back Bay or Fifth Avenue house, without provoking attention by any deviation from the existing styles, though this old work has a quaint, mediæval air about it that would hardly be reproduced on the other side of the Atlantic. In plan the house consists of three stories grouped about a rectangular court. The exterior of the building is quite uninteresting, but the court-yard presents a very pleasing appearance, with its open arcades, high mullioned windows, and brick and stone dormers. The offices and private apartments of the old printer are in the portion of the building shown in the sketch. On the left are the waiting, proof and book rooms, above which are a number of reception-rooms, all richly hung with tapestries and stamped leather, and containing some very good oak furniture. On the farther side of the court are the composing and press rooms, with the old hand-presses, type-cases, and everything left intact and ready for work to-morrow, should the old printers return to claim their own. On the right of the court-yard are the society rooms, parlors, etc., with a well-stocked library in the upper story. In the attic of the portion represented in the sketch is a cosy den where Plantin made his experiments in inks and type-metals. Below, on the farther side, is a bedroom, with a richly-carved bedstead, the cornice of which is shown in the sketch. Adjacent is a quaint little gem of an ante-chamber, the walls all aglow with rich stamped and gilded leather, the ceiling crossed by heavy oak beams black with age, one side of the room filled by a large mullioned window set with small, leaded squares of dingy glass, the other side having a small bay and cosy seat projecting into the main hallway, which passed by on a lower level. The hangings and upholstery of these rooms are mostly of heavy brocaded silk, all the pieces dating from the sixteenth century, while many of them actually served their present purpose during the time of Christopher Plantin. In finish and effect they compare very favorably with the best work of the present time. The floors throughout are of oak, waxed thoroughly until they are as smooth as glass.

In one of the halls is a very interesting collection of old prints and copper engravings used by Plantin and Moretus in their works, including some very excellent line engravings made from Rubens's most celebrated paintings. There are also several sets of curious initials, some of which were designed by the great painter, who appears to have been a friend of the family, though not above occasionally making designs for types, and taking pay for it, too, as is shown by some signed receipts which can be seen in one of the rooms.

A visit to this old mansion well repays the student or artist; indeed it is unique of its kind, and with the cathedral is almost all that remains to show the mediæval luxury and artistic taste of the now modernized city. C. H. B.

THE *AMERICAN ARCHITECT* STABLE COMPETITION.—IV.

THE JURY'S AWARD.



"*VITRUVIUS, JR.*"—Plan good. Two living rooms in loft unnecessary. Hay-loft too small and crowded. Carriage-room would also probably be crowded. Exterior chimney peculiar. Hood over carriage-door unnecessary. Ventilator boxy and small; should be over main ridge. Eaves too much cut up. Rendering hard and dry.

"*Pickwick.*"—Waste room in carriage-room. Plan otherwise good. Exterior walls too high to eaves, and first story too high. Windows unnecessarily large. Plaster-work in gable over carriage-room door unnecessary. Mass simple. Details simple. Rendering thin; lacks shadow, and is spotty.

"*Minimum.*"—Coach-house bad in form; allows very little room for carriages to be moved. Water-closet occupies too much room; so does fuel. Exterior: Flat dormers are always unpleasant, unless used alone without contrasting with other forms, or used in a row. Projection over hay-door needs study; it is too prominent. Main door should not cut up through belt-course. Eaves lack projection. Rendering hurried.

"*Private.*"—Much waste room in plan. Harness-room inconvenient. There should be stall hay-chutes. Roof too much cut up. Bracket detail is a curious compound of a heavy stick and very slight lattice-work — too much contrast. Roof over hay-door peculiar but not picturesque. Rendering too much all-over and labored.

"*The White Horse.*"—Plan good. Harness-room too large. Exterior needs study in proportion; mass is simple, but ventilator is too large; windows are poorly proportioned; arched head to carriage-house door is not agreeable. Stall-posts have an excellent turning. Rendering is weak.

"*Wheelwright.*"—Plan good. Cow-pen would have been better placed at the end. There should be stall hay-chutes. Exterior is uncertain whether to adopt pyramidal treatment or long roof, and does neither. Ventilator is too high. Details are good. Stall-post has good turning. Rendering is a little uncertain; lacks firmness.

"*The Author.*"—Harness-case inconvenient. Cow-stall should be separate. Exterior is unsuccessful: Walls are too high; ventilator is too high; roof over hay-door too slight pitch; it would have been better to have made a gable over hay-door. Ventilator is too high and needs study; and a ventilator with chimney carried through is very difficult to make successful in point of design. Rendering good.

"*Cuyahoga.*"—Plan is bad, especially the entrance to carriage-house being set in an angle. There is also much waste room. Harness-room is too large. The angle at which carriage-house door is set seems to have been an intentional attempt at unusual effect, and as such is fatally successful. It cuts up the entire mass of the building and makes the problem of roofing particularly hard and particularly unpleasant. Open timber-work with plaster between should only be done in reality, with heavy hard-wood beams, as in the European examples. To imitate it is like all other imitations — unsuccessful. Rendering is careful but labored.

"*Good Luck.*"—The plan is very good but not at all economical. Mass simple. Eaves lack projection. Walls seem too high and stable too boxy in consequence. "*Good Luck*" has a particularly vicious method of rendering elevation and perspective; very spotty, and losing all sense of masses of shadow or tones of light and shade.

"*Virtus sola honorum corona.*"—Plan is absurdly complex for a $1,500-stable, and has not the virtue of being convenient. False open-timber work has been criticised already in "*Cuyahoga's*" design. As the plan is so cut up the roof is necessarily the same. Rendering is careful but very labored.

"*T-Square.*"—Plan is fairly good. Exterior is very bad. Roof

all cut up. Ventilator too small. Details commonplace. Chamfered work should only be used in very small quantities on heavy beams or sticks, and the chamfers should be small and carefully studied. Stained glass in a carriage-room door is slightly incongruous. Rendering scratchy.

"*Try-Angle.*"— Brick stable too expensive. Carriage door should be towards right, to allow carriage to be driven in while others are in carriage-room. Man's room too large. Ventilator too large. Windows too large. Rendering needs outlines.

"*Try.*"— Stable much too large. Walls too high. Waste room in plan. Ventilator too large. Details too elaborate and too many V-cuts and turned rosettes, than which there is nothing worse in wood so-called architecture. Rendering very scratchy.

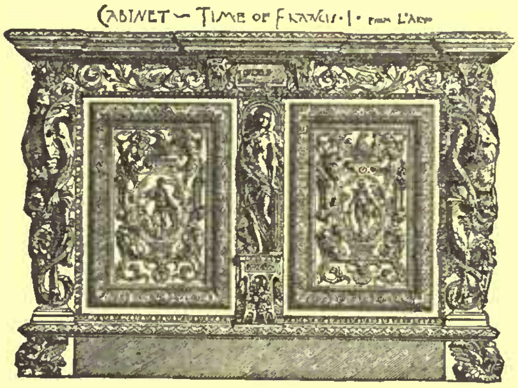
"*Owner.*"— Much too large in apparent mass; looks like a house. Windows of bad proportion. Two rooms for man unnecessary; plan otherwise sufficiently good. Cresting is an abomination. Rendering is too much "all-over."

"*Con.*"— Plan is good. The weak point of this design is its roof, which is too much cut up. Ventilator is too large. Details carefully drawn. The finial needs study. Rendering is careful — a little too careful; lacks freedom.

"*Ghinx.*"— Plan poor. Stalls should never open into carriage-room. Much waste room. Entire exterior very badly cut up, both in walls and roof. Details crude and commonplace. Rendering careful but labored.

THE PERILS OF UNDERPINNING.

CABINET — TIME OF FRANCIS · I · FROM L'ART



UNDER this title we recorded last week the result of an action to recover damage in compensation for injuries received through negligence on the part of defendant. The circumstances were as follows: The defendant in the action employed the plaintiff, a bricklayer, to do certain work on defendant's premises, who personally superintended the work. He was to underpin a wall with Portland cement. The wall was underpinned nine feet, but as this was not considered sufficient, the defendant gave orders to underpin another eighteen inches, which was excavated to the whole length of the wall. While the plaintiff was engaged in the operation of pinning up, the wall came down, breaking his legs, and necessitating his confinement in a hospital for fifteen weeks. It is almost needless to say the jury found a verdict for the plaintiff, assessing damages at £100. There was an obvious case here of negligence. The wall having been underpinned nine feet, an extra eighteen inches was ordered, and the navvies had actually excavated the entire length of wall to the required depth. Two lessons are to be drawn from the occurrence. Mechanically, the risk of undermining a wall, or taking away its support even on one side, is great, and incurs serious danger, notwithstanding which we find bricklayers ready to risk their lives upon the most foolish assumption. They often think an old wall will bear any amount of cutting about, and that it is self-supporting. Not long ago we examined a party-wall which had been excavated along its whole length on one side below the footings. What occurred may be easily imagined. The lessee of the adjoining house suffered much in consequence. The walls throughout the house were seriously cracked, and the settlements threw all the sash-frames and cupboard doors near the side wall out of square, so that they could not be opened or closed. The staircase walls showed large fractures, the steps of stone were cracked, and the sills of windows and the papering and plastering were also fractured and torn. The whole wall, which was a heavy one, had sunk, owing to the lateral resistance of the soil below the footings having been removed. There was a natural compression of the ground below the wall, which might have ended disastrously if the cross-walls and connections had not been contributing to the support. The operation of underpinning is one of those which frequency has rendered careless. It is a common thing to find a considerable removal of wall before the pinning up is commenced; a proceeding which is thought to expedite the work. Nothing can be more dangerous to, nor more reckless of, the lives of those employed in the operation. The very term "underpinning" expresses a piecemeal process, the removal of only a small portion at a time, and the part pinned up in cement and hard materials. A wholesale excavation beneath an old wall is simply taking away its support and hastening its fall. We see besides a variety of operations carried on adjoining a wall of very unstable character, such as digging trenches for foundations and draining, without the slightest care being exercised by shoring the structure. In walls of doubtful composition, or full of old insertions and settlements due to bad foundation, the utmost caution ought to be used, by strutting the wall and inserting "needles" under shaky parts of the structure. On clayey and peaty soils the drainage of water has often a very prejudicial effect, by causing the foundation to yield.

As most of our readers are aware, in common law a neighbor has a right of natural support of the soil; so that if an adjoining owner, by underpinning, causes it to fall he is liable for damages. There is a special easement of support from adjoining land acquired after a certain period of time (twenty years). The case of "Rigby *vs.* Bennett" is instructive as showing the liability of a building-owner to underpin his neighbor's wall before going below it. The plaintiff bought some land in Whitechapel on a building lease, subject to approval of plans. After obtaining consent, he commenced building. An adjoining lot was subsequently purchased by the defendant on like terms, and he proceeded to build an end wall, and commenced to excavate below the plaintiff's foundations, calling upon him to take steps to underpin or otherwise secure his building. The plaintiff refused, and obtained an injunction restraining the defendant from further excavating without underpinning plaintiff's walls. It was arranged that the underpinning should be done so as not to delay time, and the cost of it await the trial. The Vice-Chancellor decided in favor of the plaintiff, and the defendant had to pay cost of underpinning. The defendant appealed against the decision, but the court dismissed the appeal with costs, it being held that the first to build and take up his lease was entitled to support of the adjoining land, and if the defendant wished to go down lower, he must first underpin his neighbor's wall. The same thing would have happened if the wall had been a party-wall, unless the plaintiff derived any benefit from it, in which case he would have had to pay his proportion of the cost.

Walls are sometimes found to overhang from insufficient foundations, and the greatest care is required in underpinning. An important case of this kind was heard some time ago (December, 1878) before the Master of the Rolls ("Duke of Westminster *vs.* Tattershall"). The plaintiff sought to restrain the defendant, who had erected a massive building of great height, from overhanging the plaintiff's land, and claimed damages for the injury. The wall in question abutted close to the plaintiff's land, part of the brick footings and concrete of the wall being within the limit of the same; in fact, the foundations were alleged to be upon the stratum of peat above the London clay, instead of being carried down to it. An irregular subsidence took place; the wall had cracked, and the external wall overhung the plaintiff's land ten inches, so that he could not proceed with his building. On the defendant's side it was contended that the wall would not have further encroached had the plaintiff properly shored up the building after having dug certain trenches. Certain strengthening works were rendered necessary, for which the defendant made a counter claim. Here was a building resting on a bed of peat, which, as it was affected by moisture, caused cracks to appear. How to deal with a building so situated is not an easy matter. It was alleged by one of the witnesses called that the piles driven for the new foundations shook the concrete under the building and caused the cracking. We merely instance the case to show the extreme carefulness necessary in preparing foundations for new buildings next to structures of doubtful stability. After the piles were driven, the earth was excavated and concrete filled in, the piles being wedged up tightly — the only right course that could have been pursued. But excavating trenches near or below walls of shaky condition, especially when the footings rest upon peat, is not a plan that can be defended, nor is underpinning in brick practicable where great weight has to be borne. It has been said by a good authority that it is not possible to underpin ninety tons by bricks, as they would crush. In such an instance, the only substantial means of securing stability is to use Portland cement concrete for the underpinning, and to take every care to secure the wall from cracking or collapsing, by shoring.—*The Building News.*

THE ILLUSTRATIONS.

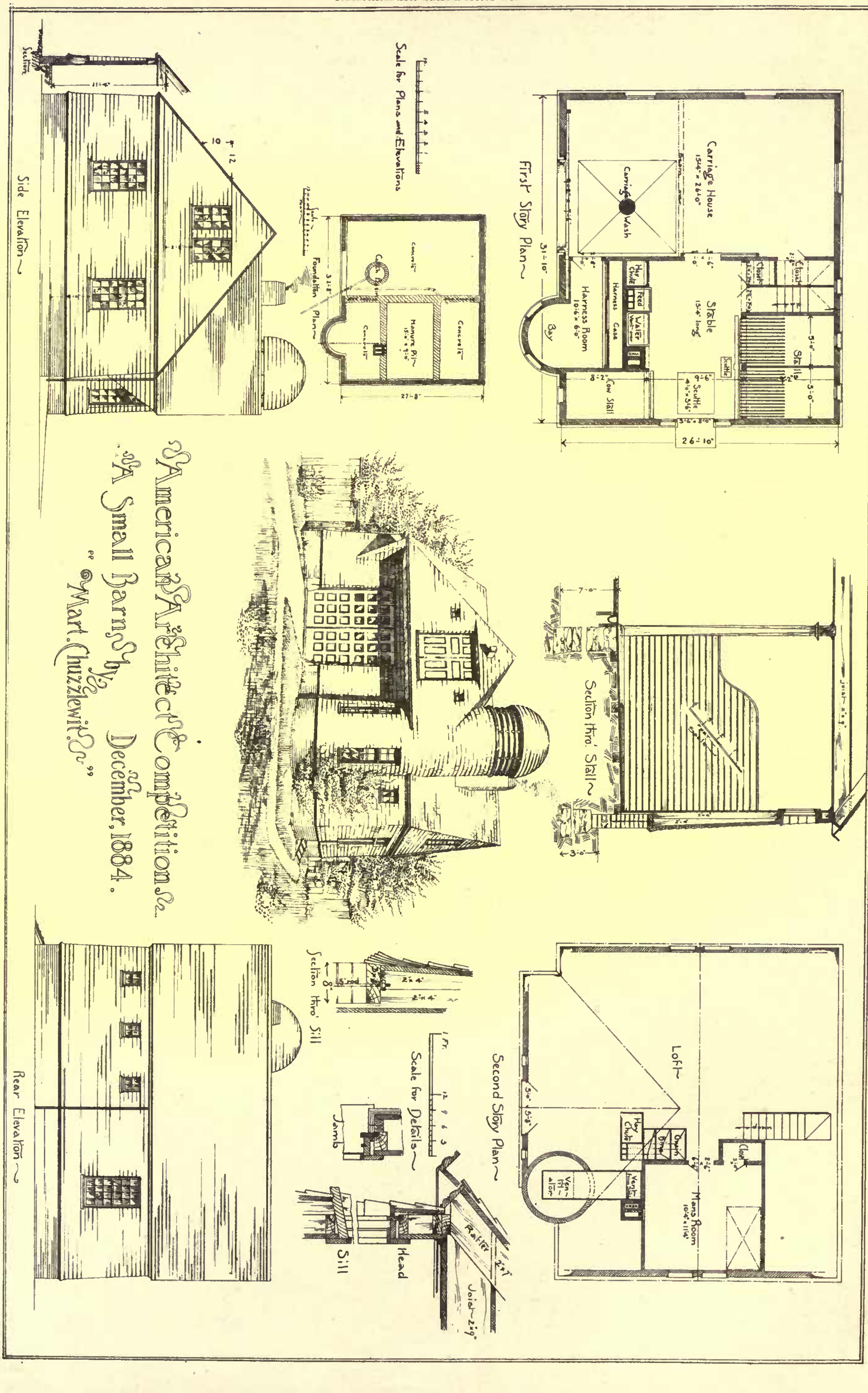
[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

COMPETITIVE DESIGN FOR A SMALL BARN BY "*Mart. Chuzzlewit.*"

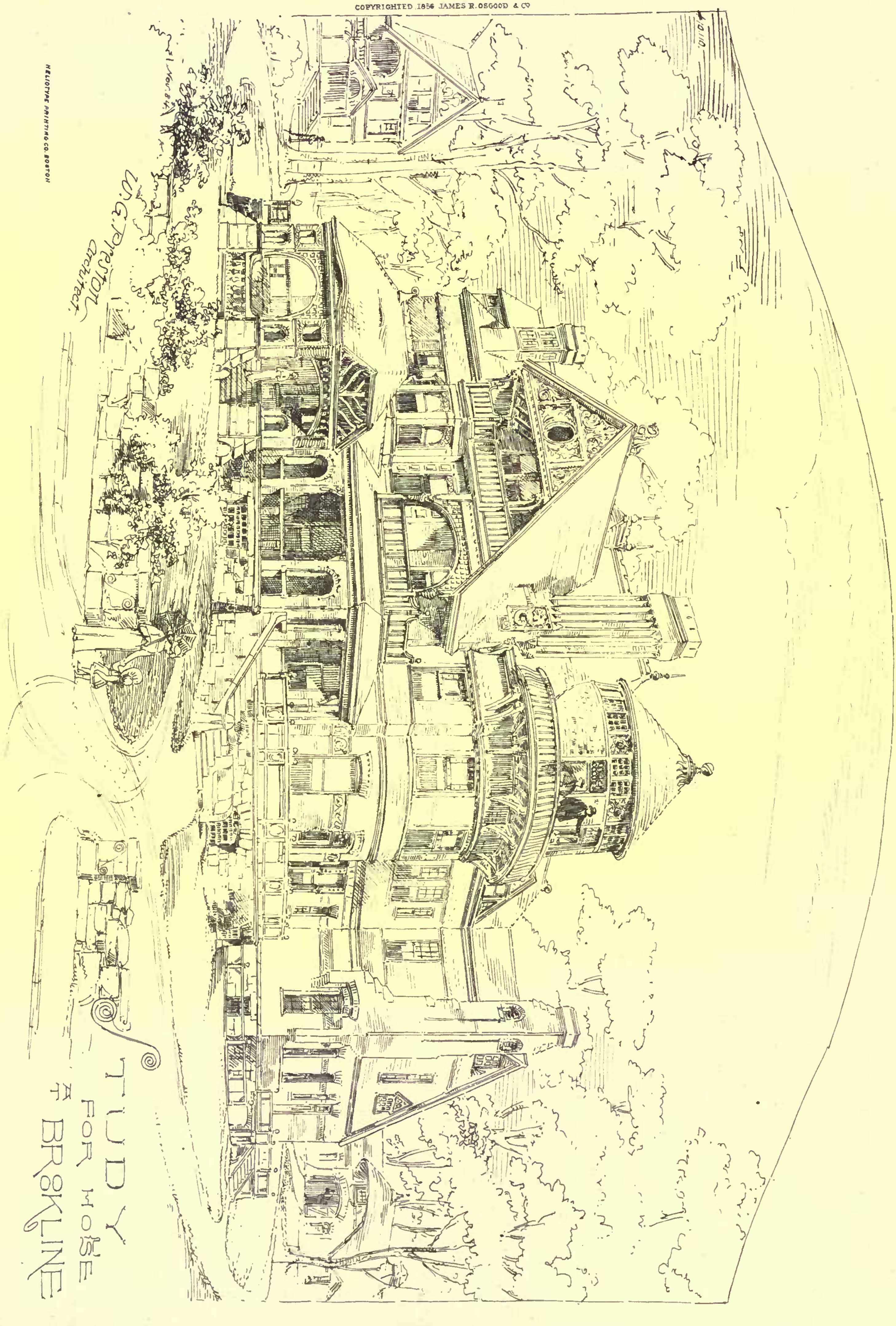
IT is intended to erect this barn on a nearly level lot in the suburbs of Providence, R. I.

The earth taken from the manure-pit and trenches will be used to fill in between the walls to raise the floor to the required level, and to form the incline at main entrance. The foundations will be ledge-stone, and the underpinning and chimney will be built of good hard body brick. The threshold, side pieces, and door-guards at main entrance will be granite. The floor of carriage-room will be sidewalk concrete, laid to pitch to carriage-wash, which will have a catch-basin, connected with sewer and covered with a perforated iron cover. The floors of harness-room and stalls will be laid on sleepers bedded in concrete; but the floor over manure-pit will be laid on creosoted spruce joist. The man's room in second story will be lathed, and plastered one coat.

The timber used in framing will be of spruce, except outrigger, which will be of hard-pine. The sides and roof will be boarded with hemlock and shingled with yellow cypress shingles dipped in creosote oil. The outside finish will be of yellow cypress, painted two coats.

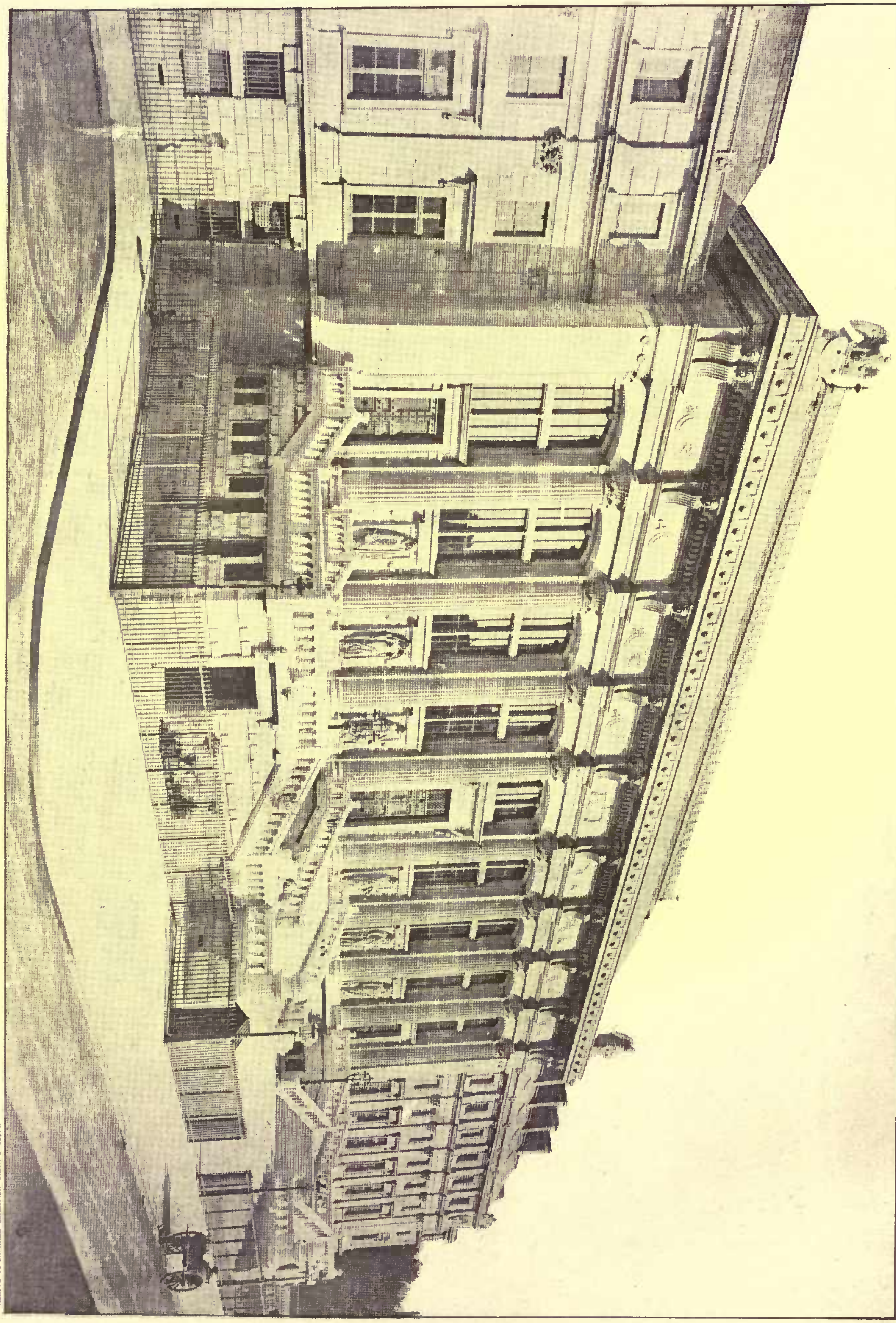


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No. 482. American Architect and Building News. Mar. 21, 1885.



Palais de Justice, Paris, — L. J. Duc, Architect.

Photo Caustic, Heliotype Printing Co. Boston

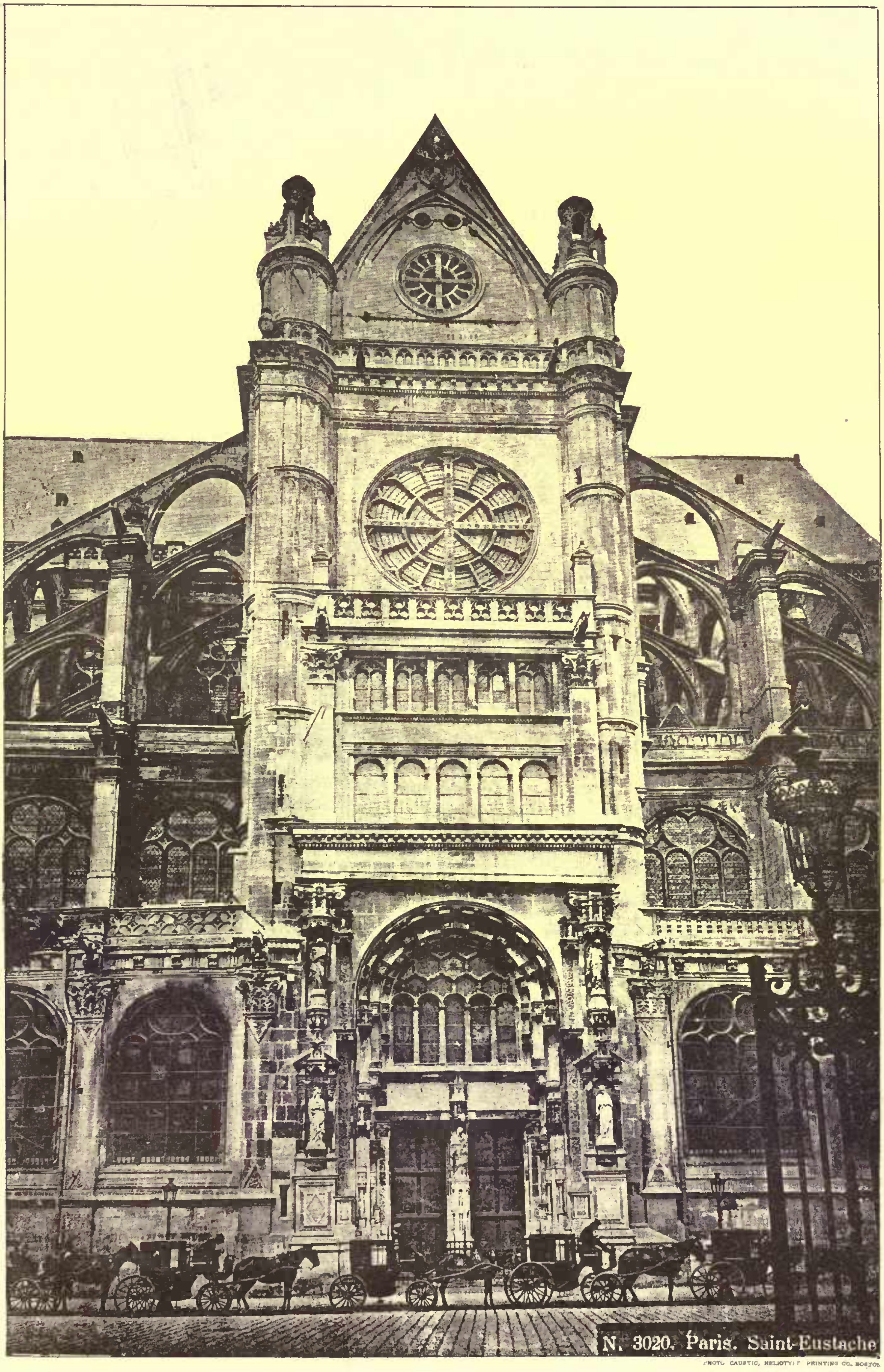
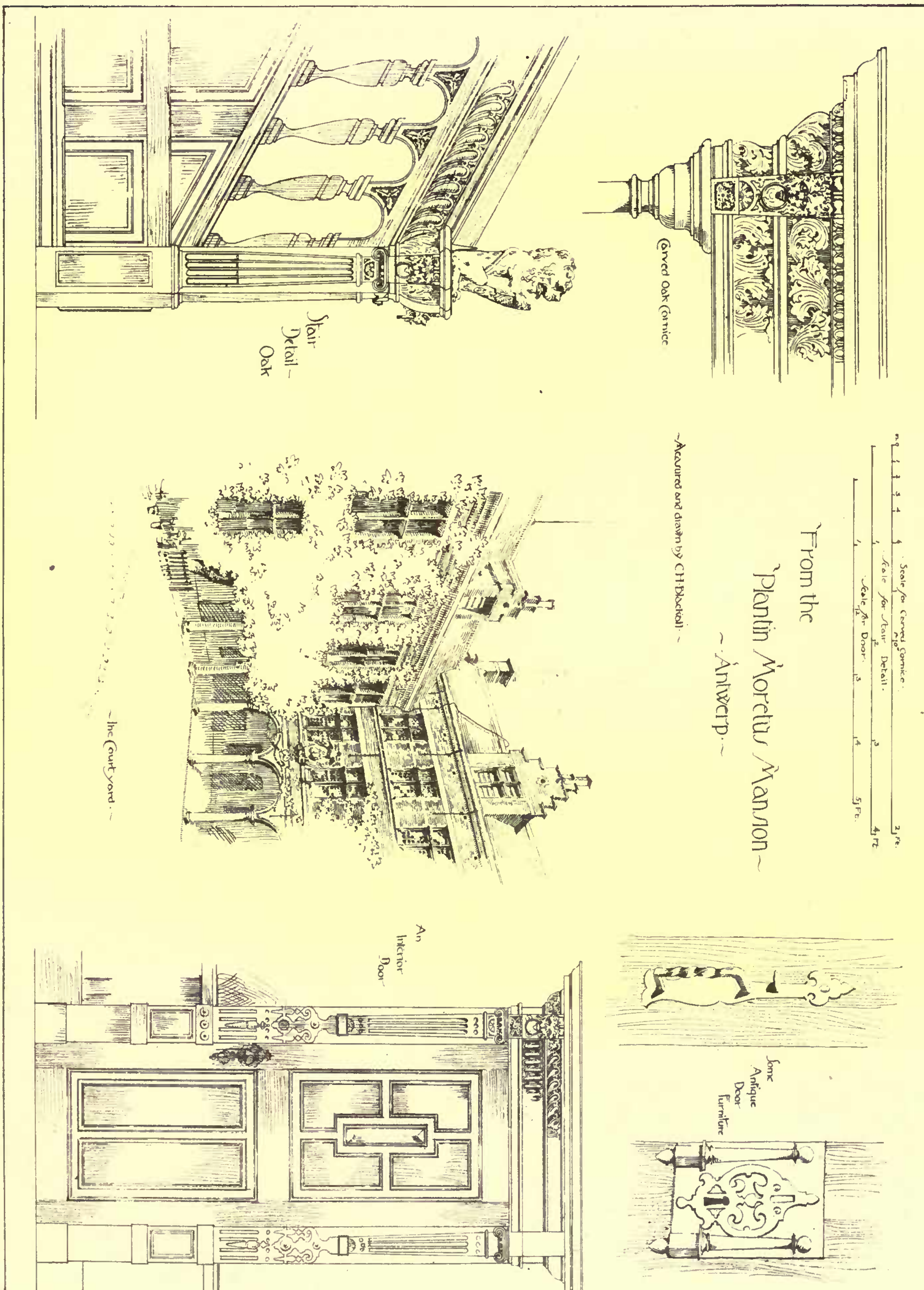
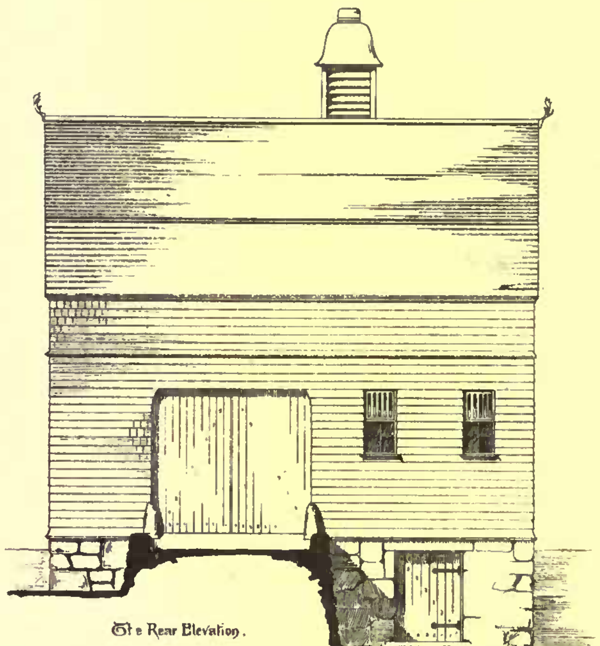
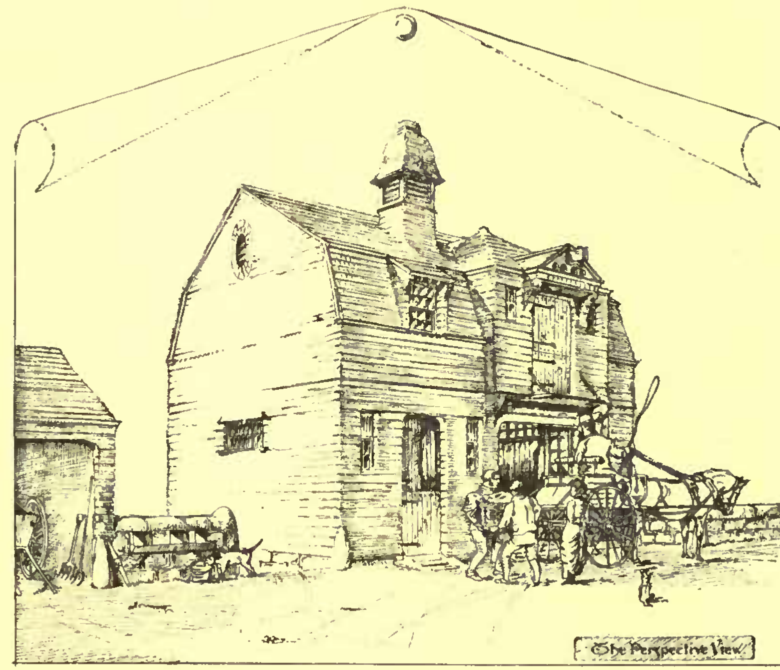


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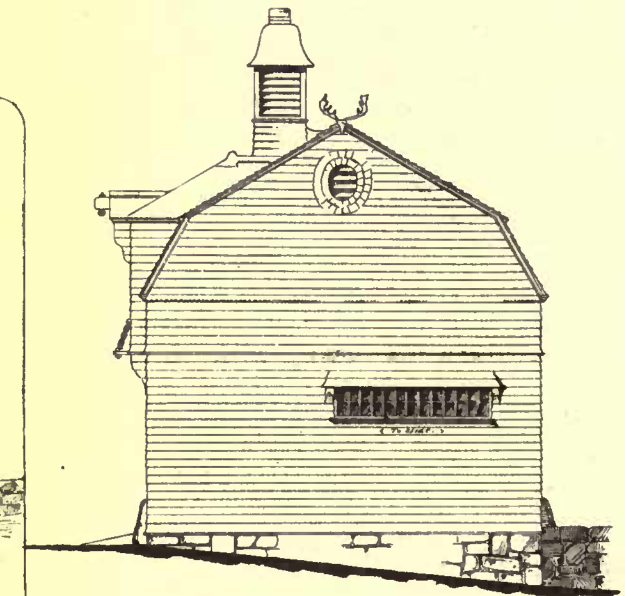

Stair Detail — Oak
Carved Oak Cornice
— Measured and drawn by C.H. Blackall —
From the Plantin Moretus Mansion — Antwerp —
Scale for Carved Cornice
Scale for Stair Detail
Scale for Door
— The Courtyard —
An Interior Door
Some Antique Door Furniture



The Rear Elevation.



The Perspective View.



One End Elevation.

✲ AMERICAN · ARCHITECT · COMPETITION ✲

BARN · TO · COST · $ 1000·00 — $ 1500·00

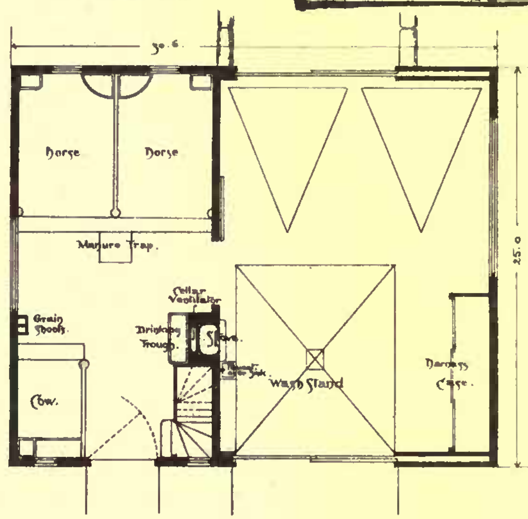
DESIGN · BY · "THE AUTHOR"

10 5 0 10 20 30 Feet.

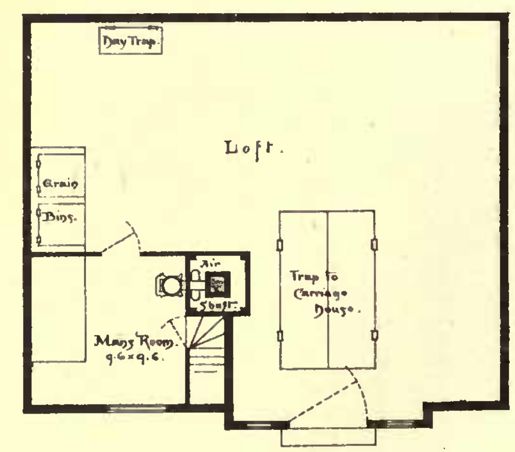
Scale.

- Stable 10·0 high.
- Mans-room 8·0 high.
- Stalls 6·0 x 9·0. Cow Stall 6·0 x 4·0
- Carriage House. 17·0 x 23·0
- Manure Cellar below Stable only.
- Trap door in Loft for passage of Sleigh &c.

Ventilation of Manure cellar by Shaft at back of Stove opening into Main duct (built around chimney to secure upward current) at level of ceiling of Stable.
Stable & Carriage Ventilated by Registers over windows & thro ceiling into main shaft.



The Stable & Carriage House.



The Mans' Room & Loft.

The water from the roof will be taken from the gutters by three galvanized-iron conductors. The under floor in stable and harness-room will be of creosoted spruce. The upper floor over manure-pit will be of creosoted hard-pine plank, that in stalls of oak plank, and in harness-room of best clear spruce. The single floor in second story will be spruce. All the inside finish in first story, and the architraves and base-board in man's room, second story, will be of yellow cypress, in the natural color of the wood. The doors and sash will be of white-pine, painted two coats. The doors in second story will be sale doors; those in the first story will be from detail drawings. The hay-chute will extend up 2′ 6″ above second floor and have door in first story hung with weights and pulleys. The chutes from grain-bins will have two slides at the bottom of each, the space between them holding just one quart. The cap to stall-partition, the mangers, the harness-hooks, the water-trough and the stall-gutters will be of cast-iron. The traps to stall-gutters will empty directly into manure-pit. City water will be brought into the barn from the dwelling.

The stable is ventilated by a box-flue to ventilator, opening in ceiling over water-trough, and closed by a wooden valve that can be operated by cords from stable floor. The manure-pit is ventilated by one of the chimney-flues; the other flue will have a stove-pipe collar in harness-room and in man's room. The closet opening from stable may be used as a water-closet by placing the partition a couple of feet farther back, and the drain will be laid to that point when the barn is built, so that a closet can be connected at some future time. The cow-stall is placed in the stable, so that if the owner does not wish to keep a cow, he can use it for a horse or pony stall. By furring on the outside studding we are enabled to show a comparatively high underpinning, with stone door-guards, on a wooden barn, and at the same time sheath on the inside, while the increased thickness allows us to shingle-in the window and door jambs, which, with the latter, form features of this barn.

PROVIDENCE, R. I., December 18, 1884.

WE will furnish all the material and do all the labor, as shown on plans and described in specifications, for the erection of the barn, submitted by "*Mart. Chuzzlewit*," for the sum of thirteen hundred and fifty-five dollars ($1,355.00). WILLIAM GILBANE & BRO.

Contractor's estimate,	$1,355.00
Architect's fee, 8 per cent,	108.40
Total,	$1,463.40

The contractors were furnished with a full set of specifications upon which to base their estimate.

COMPETITIVE DESIGN FOR A BARN, SUBMITTED BY "*The Author.*"

BY reference to the drawings it will be seen that the two horses are provided with stalls six feet by nine feet, with plenty of free space behind them, while the cow has a stall four feet by six feet, far enough away from the horses to be safe from their heels. The stalls are supposed to drain into the manure-cellar, which extends below the stable only, and has a cemented floor and walls, and an air and water tight stable floor over it, thus securing the full benefit of both solid and liquid manure, while the ventilating-pipe, passing up behind the stove and opening into the main air-shaft at the level of stable ceiling, carries off all offensive gases. The drinking-trough is placed near the stove, so that in winter the water will not be too cold; and in the carriage-house a stand-pipe and faucet are also near the stove, and are thus secured against frost.

The stairs to man's room and loft could open out of carriage-house if desired. The grain-bins are placed in the loft, and chutes are provided to connect with the stable. The carriage-house and stable are both ventilated at the ceiling level by the main air-shaft, which is built around the smoke-flue, and an upward current thus secured in winter. Fresh air may be admitted through the registers in small windows over stalls, or at the sliding-windows to end walls. In the carriage-house is abundance of room for two vehicles in summer-time, while the cutter is stored away in the loft. In winter the carriages may be stored in less space, and ample room found for the cutter in the front portion of the house. A wash-stand and water are provided at the entrance and drained into the house system. A good-sized harness-case is provided in the carriage-house, and upstairs is a roomy loft, with bins, feeding-traps, and trap for passage of cutter or other vehicle to be stored away, while a comfortable man's room is so located that the stove-heat from below may be utilized, or a separate stove connected with the flue.

The construction calls for no special mention, being of the ordinary common frame, sheathed internally with beaded, oiled or painted sheathing, and covered externally with shingles. The roof of ventilator to be covered with tin or copper, as being near the mouth of flue.

I believe the design can be carried out for the sum named in the conditions, in confirmation of which I enclose a *bona fide* bid from a respectable contractor.

JAMAICA PLAIN, STAR LANE.

I will build the stable shown by the drawings by "*The Author*" for the sum of eleven hundred and forty-three dollars.
(Signed) A. A. AYERS.

Bid	$1,143.00
Commission, at 5%	57.15
Total	$1,200.15

The original of this bid may be seen by applying to "*The Author.*"

THE PALAIS DE JUSTICE, PARIS, FRANCE. M. L. J. DUC, ARCHITECT.

THE façade of the building here shown is probably the highest achievement of the *Neo-Grec* movement, and is thoroughly well known to all architectural visitors to Paris. It faces the Place Dauphine on the Cité, and is practically the rear entrance to the *corps de batiment* which constitute the Palais de Justice.

THE SOUTH PORCH, ST. EUSTACHE, PARIS, FRANCE.

SEE article on "Paris Churches" elsewhere in this issue.

DESIGN FOR A HOUSE AT BROOKLINE, MASS. MR. W. G. PRESTON, ARCHITECT, BOSTON, MASS.

SKETCHES FROM THE PLANTIN–MORETUS MANSION, ANTWERP, BELGIUM. BY MR. C. H. BLACKALL.

FOR description see article elsewhere in this issue.

COTERMINOUS EXCAVATIONS.



FROM THE CATHEDRAL OF VILLEFRANCHE. FRANCE

THE construction placed by the Supreme Court of California, in the case of Aston *vs.* Nolan, upon the law relating to the "rights of coterminous owners," leaves the question in such shape, with an "if" added, that hardships have been experienced by very many who have undertaken building improvements since the rendition of the decision, owing to the unwillingness of cavilling parties to submit cheerfully to any law or ruling of courts which does not in very plain terms remove all doubt and question as to meaning, application, and finalities.

This vexatious question has occupied a prominence before the courts, and among owners of property for many years, and large amounts of money have unnecessarily been expended and *wasted* in legal contests, and moneys paid to avoid litigations, because the sections of the code upon which the question hinges are so constructed that it may be swung more ways than one, and whether this way or that, the appearance of consistent reversal seems to remain.

The latest ruling of the present court of last resort reverses the interpretation of the *code* as enunciated by the same tribunal, in the case of Hood *vs.* Zile, which imposed upon those excavating for building purposes, responsibilities which do not exist under the present ruling; and if the decision was free from doubtful meanings, the case would be clear enough for all practical purposes. But the wording — "Each coterminous owner shall be entitled to the lateral support his land receives from the land of the other," is an undefined something that evolves an uncertainty, as far as the *land* is concerned. The decision in reference to sustaining and underpinning buildings in such case, is fairly clear and well defined, except for the mean little "IF" which the learned judge preparing the opinion saw fit to drag into the case, in the following language "*It may be added, IF the building has stood for a period of five years* (*in this State*) *before the excavation, the person who erected it has acquired a species of easement in his neighbor's land — a right to the support of his building as well as soil. No such question as this last is presented in the case now before us.*" This interpolation of an outside matter, which did not belong to the case before the court, has worked a hardship, unjustly, because while not in the case, yet made part thereof, furnishing a new groundwork for contests and law-suits, and the basis of refusal to those not willing to assume expenses and responsibilities which should in all justice rest upon them.

However much in harmony with ancient law, and legal logic and theories, the absurdity and unjustness of the "five year" proposition is so manifest that it is not to be wondered at that people generally express surprise that such a doctrine should find recognition at the hands of an intelligent tribunal in the year 1884; particularly in the case named, as its recognition in a certain sense nullifies the force and contradicts the decision in its main issue; and further, the "five year" doctrine is discriminating and unfair, in this: it protects the owners of old, dilapidated, and rickety structures from the costs and expenses which the same rule of law imposes upon parties who happen to own structures not more than five years old, thus affording protection to a certain class of buildings, hundreds of which in San Francisco are a disgrace to the neighborhoods where located, while better, more valuable, better tax-paying property is excluded from an equal right to protection. The injustice in such cases is often aggravated by the fact that the cost and expense to the progressive man making new improvements, of holding up and underpinning some of the *more than five year old* structures, amounts to more than the whole concern would bring, exclusive of the land if offered at private or public sale. — *California Architect.*

OVERLOADED MASONRY OF COMPOSITE WALLS.



FROM THE CAMPANILE OF GIOTTO, FLORENCE ITALY.

THERE is a risk in building too high when the material employed is of a yielding or crushable nature. It is not only on the foundation that a heavy building presses; the lower courses of the masonry are subjected to considerable pressure, especially when the weight is concentrated on a few points of support, such as piers. We can imagine a solid wall carried to such a height that the weight of the superstructure will press severely upon the lower courses, and even cause crushing to take place. Cases are rare in which actual crushing takes place, though we occasionally hear of lofty chimneys and party-walls yielding from this cause. In a wall every additional inch in thickness increases the area of the pressure, and thereby adds to the security of the wall. So long as there is a well-distributed pressure upon the stone or brick, there is not much chance of crushing in the case of ordinarily thick walls which are of good materials, as the thickness necessary for stability against overturning gives a sufficient area of base. Every extra ten feet or so of rise requires a proportionate thickness of wall, and this law enables the weight to be more uniformly distributed. But in the case of angle-quoins and isolated piers of buildings there is a limit, and we have therefore greater to fear from additional height.

These remarks are suggested from the report, in an American contemporary, of slight movements having taken place in the City Building at Philadelphia, due to the imposition of the great weight of the tower upon the lower masonry. This tower, it is said, will be the highest structure in the world next to the Washington Monument. Its weight is enormous. The architect, Mr. McArthur, it is said, has carefully calculated the piers and foundation, and the strain upon them is stated to nowhere exceed nine tons to the square foot. Yet, notwithstanding this limitation, there has been a settlement of the more heavily-laden portion, which has cracked and broken the polished and sculptured stone in the interior. This has been attributed to the filling of the joints above and below the sculptured stones out to the face of the work. By a very natural and usual subsidence or settling of the brick backing, the pressure was thrown on the facing stones, and the mortar hardening first on the outer edges caused them to become "flushed" or chipped. We have here a most riskful mode of building lofty structures. The same incoherent kind of construction led to the fall of the Bradford chimney some time ago, and to that of Chichester spire. There were in the first an outer and inner casing, and a rubble core in the centre. In these cases the whole weight is often transferred to the outer facework, which must speedily yield. The transference of the weight is often made before the building is completed, for the inner core or rubble-work, being largely composed of mortar joints, settles as the work rises, until the chief weight is borne by the outer facings. All those acquainted with building know the dangers resulting from compound walls of every kind. Inequality of settlement is the result, causing cracks and throwing weight on certain points. Unless the joints of the backing of the wall be equal in number and thickness to those on the facework, unequal settlement must take place unless the joints be in cement. Walls with ashlar stone facing, with rubble behind, and of brick ashlar, are equally liable to the danger of irregular pressure; the former have been known to collapse, or the facing to bulge, by hydrostatic pressure, or under a severe fire to crack and fall; and the latter, composed of a brick facing of superior quality with thin joints bonded with headers at certain heights are apt to separate from the backing. We question very much whether it is safe to build high walls and lofty structures under any circumstances with materials so arranged, and the failures we have recorded from time to time show that it is never prudent to build to any great height with a rubble or brick core and facings. The very nature of a composite wall with a centre and two outer sections is for the middle and weightier section to sink and drag down the outer sections, or to jeopardize one or both facings by throwing the whole weight upon them. The principle is one of internal disruption, for it is impossible to insure to the three sections the same degree of settlement. Even when through bonders are introduced, they get broken off by the settlement of the backing.

There is a further cause of failure in walls of great height. The weight is often thrown or concentrated on one edge. Nor can the architect avoid such a distribution of weight. A massive cornice or dressings on the outer side will be sufficient to cause an overhanging of the wall on that side. The thrust of roofs and arches internally may produce the same effect, and, therefore, what has been calculated as a safe margin of pressure may be entirely frustrated. So long as the weight is evenly distributed through the whole thickness of the wall there is ample resistance to prevent crushing, but directly we consider the effect of the weight being transferred to an outer edge, perhaps a mere line of the surface, all ordinary calculation is rendered useless. Further than this, as we have said at the onset, we must take into account the limitations of isolated piers, and a concentration of pressure brought upon their outer edge. Calculations of pressure based upon a unit of nine tons per square foot, or even double that amount would scarcely be sufficient under such conditions.

And then, what are the crushing limits of stone and brick? One authority states that the breaking strain in compressions for sandstone is two-and-one-half tons per square inch, and for stock bricks .90; but such figures are excessively high when it is known that brickwork set in cement has been fractured at 36 tons per square foot. The highest resistance for brickwork has been found to be 621 pounds per square inch. We know, practically, that Portland stone is capable of supporting great weights; the piers carrying the dome of St. Paul's show 17.705 tons per square foot, and according to the experiments made on the brown bed, the ultimate resistance of the stone is 1.68 tons per square inch. Reverting to a more practical question, the fractured stones at the Philadelphia building, architects may learn from this instance the importance of specifying in the case of heavy structures that the outer joints should be laid "slack," so that when the pressure comes upon the outer edges the stone will not "flush." The interposition of sheets of lead, wood, or even felt in the joints of piers are sufficient to prevent the distressing appearance of broken string-courses over a row of windows, such as we hear has taken place owing to want of the precaution in leaving joints open above the windows. What would have been the consequence to many of our beautiful towers and steeples if they had been built with rubble or soft cores we should hardly like to predict. Few of our majestic towers crowned with spires would have resisted the forces of so many centuries if they had been built in the manner prescribed in some modern specifications. Their massive buttresses have been helpful in resisting the oversetting force due to the wind, and in enlarging the area of base. The power of stones to resist crushing is limited. We cannot expect some of our limestones to endure for ages unimpaired by the pressure brought upon them. Disintegration goes on day by day, the particles become less coherent or dissolve away by the acids in the atmosphere, and the working margin of safety is reduced little by little. — *Building News.*

SUN-KINKS.



Old Venetian Brass Lamps recently on sale at Messrs. Little's Boston, Mass.

IN a recent journal of this city an article descriptive of a railroad accident appeared under the heading, "Derailed by a Sun-Kink." The title doubtless puzzled many readers. The term indicates that the rails were thrown out of line by expansion, due to the heat of the sun. Few accidents are attributed to this cause, though it may be responsible for more than are supposed. It will be interesting to determine a few maxima of distortion that can be thus produced.

The expansion of metals under the influence of heat is very slight. A mile of iron rails, for an elevation of temperature of 100° Fahrenheit, only expands two feet eight and one-half inches. This is so little as to be readily taken up by the one hundred and seventy-six joints that exist in that length of rails. If the rails were laid in very cold weather, in solid contact with each other, then, on a warm, sunny day, a considerable disalignment could be produced. To find the maximum for the mile of rails, we must suppose that the line breaks in the middle, and bulges out like a flattened letter V. In this condition of things, the broken line of rail, with the original line for base, would form an equilateral triangle. The altitude of the triangle may be calculated by the familiar rule of the reverse of the hypotenuse. It will be found equal to nearly ninety feet. The result, though deduced by the simplest of calculations, is an astonishing one. It is enough to account for any number of "sun-kinks." The books are very prolific of instances of expansion by heat, and always speak of the expansion of rails. They do not, however, allude to the geometrical element of danger; they concern themselves only with the physical one.

It is obvious that a mile of rails would never expand in this way. Disturbances of alignment would be confined to smaller sections. The calculation shows a maximum that would never be attained. The conditions might be fulfilled by four rails. For the given elevation of temperature they would expand about eight-tenths of an inch, with a lateral displacement of over two feet. For an expansion through 50° Fahrenheit, the displacement would be eighteen inches.

Two rails would act in accordance with the supposition most readily. Their total expansion, for 100° Fahrenheit, is four-tenths of an inch, and the bulge due to such expansion would be twelve inches. For half the number of degrees it would be nine inches. This shows

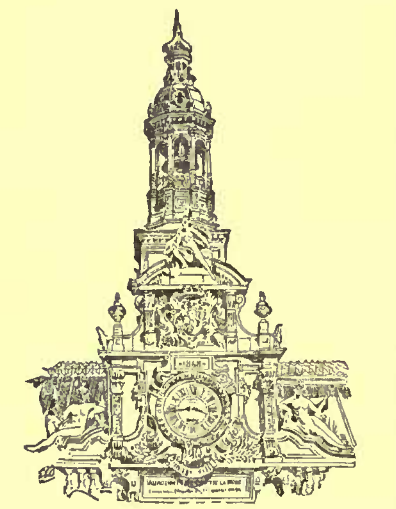
how very small a rise of temperature might produce a spreading sufficient to throw a train from the track. The smaller figures are as impressive as the ninety feet, when it is recollected that four inches displacement of the rails might produce a catastrophe.

The distortion might be confined to a single rail; and, from what has been said, it is clear how seriously the small fraction of an inch of expansion could affect it. It is an application of the old law of the elbow-joint press reversed, the working pressure taking the place of the resistance. The work is done at a great disadvantage, but the power is almost limitless.

A very good instance of "sun-kink" could be seen some years ago on the wooden bridge leading from the elevated railroad station at One Hundred and Fifty-Fifth Street, in this city, toward Ninth Avenue. A gas-pipe of wrought-iron was laid on the floor of the structure. As if to render it more susceptible to the rays of the sun, it was painted of dark color. On cold or cloudy days it lay in its normal position. On sunny days, the writer has frequently seen it bowed outward nearly or quite a foot out of line. The surface of the foot planks under this part of it became worn by the daily friction. Finally, an arrangement of bends was introduced that operated as an expansion-joint, and now no bowing takes place.

Even 50° Fahrenheit, seems a large rise in temperature. But it must be remembered that the temperature of rails, or similar objects, is affected by the radiant heat of the sun as well as by the atmospheric temperature. The latter is only the initial factor. The sun's rays could easily raise their absolute temperature above 100° Fahrenheit.—*T. O'Conor Sloane, Ph. D., in the Popular Science Monthly.*

AN OLDEN INCOHERENT EXHIBITION.



The Belfry, Hotel-de-Ville: Valenciennes, France. designed by M. Dupont.

THE exhibitions of "Incoherent Art," which have been lately introduced in Paris are not original, says *The Architect*, although they are supposed to be a special product of French wit. As far back as 1762, that is, seven years before the opening of the Royal Academy, an exhibition of the kind was held in Bow Street, Covent Garden. It was organized by Bonnel Thornton, who was the leading spirit of the *Connoisseur*. He was aided by William Hogarth. In 1762 the Society for the Encouragement of Arts, Manufactures, etc., and the Society of Artists, proposed to hold exhibitions, and for fun Thornton got up a third, which was declared to be under the auspices of the Society of Sign-Painters. It was announced that it was to contain "a most magnificent collection of portraits, landscapes, fancy pieces, flower pieces, night pieces, Scripture pieces, etc., designed by the ablest masters, and executed by the best hands in the kingdom." It was also declared in the gravest manner that the worshipful sign-painters were not prompted by any mean jealousy of the members of the other societies, for, "animated by the same public spirit, their sole view is to convince foreigners, as well as their own blinded countrymen, that however inferior this nation may be unjustly deemed in other branches of the polite arts, the palm for sign-painting must be universally ceded to us, the Dutch themselves not excepted." The strange sight that was presented to the visitors may be imagined from the description in the *London Register* of that time: —

"On entering, you pass through a large parlor and paved yard, of which, as they contain nothing but old common signs, we shall take no further notice than what is said of them in the catalogue, which the reader will not find to be barren of wit and humor. On entering the grand room, you find yourself in a large and commodious apartment, hung round with green baize, on which this curious collection of wooden originals is fixed flat, and from whence hang keys, bells, swords, poles, sugar-loaves, tobacco-rolls, candles, and other ornamental figures, carved in wood, which commonly dangled from the pent-houses of the different shops in our streets. On the chimney-board (to imitate the style of the catalogue) is a large blazing fire, painted in water-colors; and within a kind of cupola, or rather dome which lets the light into the room, is written in golden capitals, upon a blue ground, a motto disposed in the form following: —

SPECTATUM
ADMISSI
RISUM
TENEATIS

"From this short description of the grand room (when we consider the singular nature of the paintings themselves, and the peculiarity of the other decorations), it may be easily imagined that no connoisseur who has made the tour of Europe ever entered a picture gallery that struck his eye more forcibly at first sight, or provoked his attention with more extraordinary appearance."

The pictures were remarkable. Thus, for example, "The Irish Arms," by Mr. O'Blaney, represented a pair of extremely thick legs in white stockings and black garters; "A Man" was a view of nine tailors at work; "Nobody alias Somebody — a Character," was an officer all head, arms, legs, and thighs. But, according to the *Register*, "the cream of the whole jest is No. 49 and No. 50, its companion, hanging on each side of the chimney. These two are by an unknown hand, the exhibition having been favored with them from an unknown quarter. Ladies and gentlemen are requested not to finger them, as they are concealed by blue curtains to preserve them. Behind the curtains are two boards, on one of which is written 'Ha! ha! ha!' and on the other 'He! he! he!' At the opening of the exhibition, the ladies had infinite curiosity to know what was behind the curtains, but were afraid to gratify it. This covered laugh is no bad satire on the indecent pictures in some collections, hung up in the same manner with curtains over them." An opportunity was offered to amateurs to display their skill in identifying the works, and it was stated that "a remarkable *cognoscente*, who has attended at the society's great room with his eyeglass for several mornings, has already piqued himself on discovering the famous painter of the 'The Rising Sun' (a modern Claude) in an elegant night piece of the 'Man in the Moon.'" The *St. James's Chronicle* of that day could not see any humor in the exhibition, and the charge of a shilling was said to be a swindle; and, after a condemnation of the affair, wound up by saying: — "In fine, this exhibition is a most scandalous abuse and bubble. The best entertainment it can afford is that of standing in the street and observing with how much shame in their faces the people come out of the house."

POLLUTION OF STORAGE RESERVOIRS.

WASHINGTON, D. C., March 10, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — The discussion of this subject in your issue of March 7 leads me to offer a note as a contribution to the study of its cause.

More than twenty years ago this disease attacked the water of the Washington Aqueduct. About the same time Boston's Cochituate, New York's Croton, and Cincinnati, which takes its supply from the great and ever-flowing Ohio River, suffered in precisely the same way. It has appeared several times in the Washington water, and these several times, in two or three seasons, it has been as offensive in the clear and rapidly-flowing Potomac as in the reservoirs. It is not, therefore, a disease of impounded water alone. With a large glass jar to collect samples for analysis, I, when it first attacked our receiving reservoir, launched a boat on its surface. The water was covered with a very thin but visible green film. The boat's wake was light. Wherever the oars dipped, the clear, bright water appeared through the broken film. I skimmed enough to fill a gallon jar with, half green stuff, the other half water. It was offensive in taste and odor. Examined with microscopes it was found to consist of the cells which seem to constitute the lower orders of vegetable life, some of which are difficult to distinguish from living creatures. I opened the wastes and drew off three or four feet of water. A violent squall and heavy summer rain supervened. The next morning the shores left by the lowering of the water were covered with a blackish-green coating; for when drying and exposed to the air and sun, these atoms turn black and adhere to each other in a sort of tough tissue. The water was clear and good again. This same process has been repeatedly witnessed since. A violent rain-squall with its attendant wind breaks up the film, which seems to blow ashore and there perish. A few years since, after several days' discussion in the newspapers, a delegation of our city authorities went up the river to endeavor to find the source of the mischief. Green scum covered river and reservoir, and made the journey to Seneca disagreeable. A violent rain-squall met the party, and they returned to Washington to report that all traces of the disease had disappeared with the storm. This vegetable growth is too extensive under favorable conditions of temperature and weather to be controlled by artificial means. It comes, — we may be thankful, — not every season; but when it does come it runs its appointed course like small-pox, but there is no recorded case of death or even of sickness being attributed to it. It is disagreeable, but not poisonous.

M. C. MEIGS.

A LABOR COMMISSION'S REPORT ON THE CITY OF PULLMAN.

NEW YORK CITY, March 9, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Will you tell me where I can get the report referred to in the last *American Architect* concerning the city of Pullman? and you will oblige, Yours, etc., F. A. WRIGHT.

[WRITE to Mr. Henry Luskey, Secretary of the Commission. Ohio Bureau of Labor Statistics, Columbus, Ohio. — EDS. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS.

Discoveries in Rome.—I have not yet seen that you have received news of a late very important archæological discovery in Rome. On some property near Porta Salara, sold by Prince Bonaparte to an Italian company, there have been found, at a depth of about nine feet, the graves of four very distinguished historical personages, three of whom were members of the patrician family of Sixinius Crassus. The graves are those of Cneius Pompeius, nephew of the great Pompeius Magnus, "Pontifex," Prefect of Rome, and Questor, who was murdered by order of the Emperor Claudius; his brothers, Marcus Sicinius Crassus, murdered by order of Nero, and Piso Sicinianus, Quindecemvir, and four-days' Cæsar, adopted by the Emperor Galba, and murdered by order of the Emperor Otho; and of Verania Germina, daughter of the Consul Quintus Veranius. It has aroused the astonishment of the Roman archæologists that the epitaph on the tomb of Cneius Pompeius Magnus expressly mentions the Emperor Claudius as his murderer.—*Naples letter to the London Standard.*

A Really Wonderful Clock.—Probably the most wonderful timepiece ever heard of is a clock described by a Hindoo Rajah as belonging to a native princess of Upper India. In front of the clock's disk was a gong, swung upon poles, and near it was a pile of artificial limbs. The pile was made up of the full number of parts for twelve perfect bodies, but all lay heaped together in seeming confusion. Whenever the hands of the clock indicated the hour of 1, out from the pile crawled just the number of parts to form the frame of one man, part joining itself to part with a quick metallic click, and when completed the figure sprang up, seized a small mallet, and walking up to the gong struck one—the first hour. When 2 o'clock came two men rose up and did likewise; and so through all the hours of the day, the number of figures being the same as the number of the hour, till at noon and midnight the entire heap sprang up, and marching to the gong, struck one after another each his blow, making twelve in all, and then fell to pieces again.—*Chicago Tribune.*

Petroleum as Fuel.—Petroleum is to all appearance destined to effect changes in commerce and industry, second only to those wrought by steam itself. Petroleum waste is already being extensively used for fuel on Russian railways; the steamships on the Caspian use nothing else. It is said that crude petroleum, after a few day's exposure to the air, may be used for the same purpose with perfect safety, and petroleum fuel can be delivered at Batum at twenty-six shillings a ton. If the scheme for running pipes from Baku to Batum be carried out, it can be laid down for very much less. But weight for weight, petroleum goes nearly three times as far as coal, and coal being worth at Batum from £2 to £3 a ton, it follows that 26*s.* worth of the liquid is equal to from £4 to £9 worth of the solid fuel. The extinction of our coal trade with Russia has become a question of a few months. Nor is this all. Petroleum goes into far less bulk than solid fuel, and can be handled at far less cost. If it could be used by ocean-going steamers for long voyages, the gain would be enormous. By storing the oil in the ballast tanks, the space now occupied by coal could be utilized for cargo; and as the fires are fed automatically—the petroleum being pulverized by a jet of superheated steam—the cost of stoking would be reduced to almost nothing. And this is no mere dream, but a present reality. "So simple is the fuel to use, and so reliable is the action of the pulverizer," writes Mr. Marvin, "that the English and Russian engineers, running the steamers from Baku to the mouth of the Volga, told me that, having turned on and adjusted the flame at starting, they concern themselves no more about the fires until they reach their destination in a couple of days' time." Petroleum is, moreover, clean to use, and makes no smoke. Another and highly valuable peculiarity of petroleum is its existence in places remote from coal-measures, and where coal for steam or any other purpose is simply unattainable. There are large deposits of it in Beluchistan, the Punjab, and probably in other parts of India. It ought also to be found in the West Indies, in the Soufrière District of St. Vincent, the pitch-lake region of Trinidad, and on the Northern coast of Venezuela. Enterprising capitalists in want of outlets for their money could not well embark in a more promising adventure than a quest for petroleum springs. The new fuel is not likely to supersede coal in England; but the struggle for existence and the lowness of freights may compel its adoption by all steamers which make long voyages. The resulting economy in our rapidly lessening coal-measures, though it might not be viewed with satisfaction by the owners of collieries, would be an advantage to the community, and indefinitely postpone that dearth of fuel with which our industrial supremacy has so long been threatened.—*London Spectator.*

How Petroleum is quarried in Alsace, Germany.—A correspondent of the Pittsburgh *Dispatch*, writing from Strasburg, Germany, gives the following interesting account of the primitive manner of mining petroleum from the mines of Alsace:—

Possibly it is not generally known in America—certainly it was not to me before I visited this province—that oil was obtained from the earth here a century before it was dreamed of in Pennsylvania. Such, however, is the case. Oil wells have been worked here for about 150 years, and the industry employs a small army of workmen and represents much capital. It is chiefly centred near the town of Sulz, near the battle-field of Woerth, and just south of the Bavarian frontier. The oil-producing region extends over several square miles of territory, and is entirely comprised within the private estates of the Lebel family, who have owned it for centuries, and who were the discoverers of the oil. It is a close corporation, this Lebel family—so close that no visitors are allowed upon the grounds, and other extraordinary precautions are taken to keep secret the mode and manner of extracting the oil. The rule against visitors is now and then broken, however, in favor of the owners' personal friends, and many facts concerning the establishment leak out from the workmen employed there. This Alsatian oil is not called petroleum, I believe, although it most emphatically is rock oil. For it is found in a vast layer of sandstone, which it completely saturates. But it does not flow, and it cannot be pumped, and the people here do not know anything about "torpedoing." So they dig down to it and quarry it out in chunks—the stone and oil together—so that the oil wells are really mines, worked very much like coal mines. This was the original method, practised a century and a half ago, and it has never been improved upon, except that steam-power is now used instead of hand-power to hoist the stone from the mine—no small task when it is remembered that the oil-bearing vein of rock is 300 or 400 feet below the surface. The original vein was found close to the surface, cropping out, indeed, but it was small and was soon exhausted. The vein now being worked is apparently inexhaustible. At the opening of each shaft a large factory is built, with steam engines and a chimney stack 100 feet high. This is built before the shaft is sunk. Then the men begin to dig, lining the hole with strong timberwork as they go down. The shaft is generally about 2 yards by 4 or 5 yards in size. At a certain depth various "drifts" are dug for purposes of ventilation, and the system of ventilation is said to be very perfect. When the oil-bearing rock is reached, galleries and headings are cut through it, just as in a coal mine or a silver-ore mine. The stone is conveyed in carts to the foot of the shaft and then hoisted up in big buckets. The method of extracting the oil from the stone is a primitive one, also. It is simply put in kettles over a fire and boiled out—almost like trying out lard. The result is a pretty good quality of oil for lubricating purposes, for which it is used exclusively. No attempt at refining it sufficiently to apply to illuminating purposes has ever, I am told, been made. It is different from American oil in many respects. It has not the smell of Pennsylvania petroleum, nor does it evolve gas. If it did, it never could be mined out as it is. So free is it from odor and gas, indeed, that the air in the mines is said to be singularly pure and pleasant. No workman has ever been suffocated by foul gases, nor has there ever been an explosion. A good mine produces about 5 tons of the boiled out oil per day. They sell it entirely by weight here. The price is equal to about $9 a barrel in American measurement. The 5 tons are equal to about 50 barrels, so that a well produces, say, $450 per day. To do this it is worked day and night by three gangs of men, each gang working eight hours. The net profit to the proprietors is large, because beggarly wages are paid to the men. The highest wages paid is 55 cents a day, and many of the men get only 40 cents, or even less—so the cost of running the mine is very small. Its original cost, however, is considerable. I am told that it takes a force of 17 men more than six months to sink a shaft and get it ready to operate, and the cost is well on toward $15,000. As I have said, no flowing oil is met with, nor any gas. But several shafts have been rendered useless by being flooded from veins of water—salt water. The Alsatians never yet have heard of such a thing as pumping out a mine, and the water flows in faster than they can hoist it out with buckets. So when a mine is once flooded they give it up as a bad job and sink another.

An Underground Electric Railway.—For about two years past, says the *Electrical World*, there has been in successful operation in the Zankerode Colliery, at Plauen, Germany, an underground electric railway, which carries its cars loaded with coal over a level road some seven hundred feet in length, making twenty-five trips per day, and speeding at the rate of seven miles an hour. Its daily carriage amounts to about two hundred tons. The entire plant has cost nearly $4,500 There has been no outlay for repairs, and the wages of two employés constitute almost the total expense, so it is an economic as well as a mechanical success. The details of operation we gather from the account of a visitor to the mine. There is above ground at the colliery a dynamo which is driven by belting from a small vertical engine placed with the cylinders inverted, the pulleys being about three to one. The dynamo and engine are run at respectively six hundred and two hundred revolutions per minute. The shaft of the pit is 720 feet deep, and down it, by one-fourth inch copper wire, is transmitted the electricity, and in the road it is led along two rails like a T-iron secured to the roof of the mine. The road has a double line of rails in it, and is arched with brick throughout its length, the conductors being fastened to porcelain insulators fixed in the masonry. On the locomotive, and connected by gearing to its wheels, is a dynamo, each of whose poles communicates with one of the conductors on the roof by means of a covered wire, one end of which is fastened to a carriage running on the rail, and the other to a pole of the dynamo. When the dynamo on the surface is driven, the current passes down the shaft by one of the wires and along the conductor, until it reaches the carriage; then down the wire to the pole of the dynamo on the locomotive, and in passing through the dynamo to get to the other pole, and thence to the return, causes the armature to revolve, and the motion is communicated by gearing to the wheels of the locomotive. The proportion of useful effect in the arrangement is thus given: steam engine, ten horse-power; dynamo, five horse-power; locomotive, three horse-power—demonstrating that thirty per cent of the power of the steam-engine is got out of the locomotive. The whole affair is simple, compact and effective, and the results are perfectly satisfactory to the owners.

Michigan's Lumber Product.—The lumber returns for the State of Michigan for 1884 show the following figures: Saginaw Valley, 1,004,997,853 feet; Lake Huron shore from Tawas to Cheboygan, 495,937,079 feet; Manistee River and tributaries, 639,952,568 feet; other points on the western side of the State, 399,793,037 feet; mills on various railroad lines, 789,032,775 feet; making a total in the lower peninsula of 3,567,235,987 feet; the total cut in the upper peninsula was 608,163,229 feet, making a grand total for the State of 4,175,339,216 feet. The total shingle product for the lower peninsula was 2,724,577,300 shingles; upper peninsula, 121,323,750 shingles, making a total for the State of 2,845,841,050 shingles, of which Saginaw, Manistee, and Muskegon Rivers produced one-half. The amount of lumber reported on hand in the lower peninsula at the close of the year 1884 was 1,419,161,355 feet; in the upper peninsula, 120,913,665 feet, making a grand total of 1,540,075,020 feet.—*New York Times.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

313,041. WINDOW-SHADE ATTACHMENT. — Nelson F. Acers, Iola, Kans.

313,065. HOT-AIR FURNACE.—Benjamin W. Felton, Boston, Mass.

313,068. DISCHARGE AND WASTE-PIPE PROTECTOR.—Wellesley W. Gage, Yonkers, N. Y.

313,071. SMOKE-CONSUMING FURNACE. — Franklin B. Giesler, Milwaukee, Wis.

313,085. STAY-ROLLER FOR SLIDING-DOORS.—John H. Lawrence, Sterling, Ill.

313,098. LOCK.—Benjamin Moser, Brooklyn, N. Y.

313,099. GLASS MOSAIC FOR DECORATING ROOMS AND OTHER PURPOSES.—Rudolph Nielson, New York, N. Y.

313,138. WINDOW.—Emil Wagner, Cincinnati, O.

313,193-194. DEVICE FOR LOCKING JOINTS. — Edward L. Gaylord, Bridgeport, Conn.

313,195. PLANE FOR PICTURE-MOULDINGS. — Edward L. Gaylord, Bridgeport, Conn.

313,203. MACHINERY FOR MANUFACTURING PORTLAND CEMENT.—David Griffiths, Egypt, Pa.

313,210. SELF-CLOSING HATCHWAY. — Thomas H. Hulbert, Minneapolis, Minn.

313,217. MANUFACTURE OF PORTLAND CEMENT.—Robert W. Lesley, Philadelphia, Pa.

313,221. COMPOSITE TILING, PAVING AND FLOORING SLAB OR BUILDING-BLOCK.—Robt. Marsh, Brooklyn, N. Y.

313,228. FASTENING FOR METAL LATHS. — Aaron B. Moore, Mount Vernon, O.

313,239. DRAUGHTSMAN'S INK-MIXER. — William W. Redfield, Minneapolis, Minn.

313,240. ELEVATOR-CAGE AND SAFETY-ATTACHMENT.—Geo. H. Reynolds, New York, N. Y.

313,241. ELEVATOR.—Geo. H. Reynolds, New York, N. Y.

313,249. FAUCET.—Nicholas Styne, Brooklyn, N. Y.

313,258. FASTENING FOR MEETING-RAILS OF SASHES.—George Thumshirn, Branford, Conn.

313,261. SHUTTER-FASTENER. — Avery Van Wie, Indianapolis, Ind.

313,275. DIVIDERS AND CALIPERS.—Charles S. Barber, Hartford, Conn.

313,281. WATER-CLOSET. — August F. Blesch, Columbus, O.

313,314. VALVE FOR WATER-CLOSETS AND OTHER RECEPTACLES. — William H. Gants, San Francisco, Cal.

313,328. BOLT FOR DOORS OR SHUTTERS. — Annie W. Harris, Philadelphia, Pa.

313,371. ALARM DOOR-FASTENING. — Marion M. Roberts, Norris City, Ill.

313,375. CHIMNEY CAP AND VENTILATOR. — Konrad Reutschi, Battle Creek, Io.

313,376. METAL ROOF.—L. Lewis Sagendorph, Cincinnati, O.

313,412. WATER-PROOF COMPOUND. — John T. Elliott, Grand Rapids, Mich.

313,423. AUTOMATIC FIRE-EXTINGUISHER.— Chas. L. Horace, Brooklyn, N. Y.

313,439. LOCK.—Benjamin Moser, Brooklyn, N. Y.

313,441. FIREPLACE AND CHIMNEY.—Theodore C. Nativel, Oakland, Cal.

313,446. STEAM-HEATING APPARATUS. — Stephen H. Purdy, St. Paul, Minn.

313,450-451. AUTOMATIC HATCHWAY-GUARD FOR ELEVATORS.—Columbus K. Rogers, Salem, Mass.

313,457. LOCK-HINGE. — Samuel Tuerk, Chicago, Ill.

313,464. DOOR-OPENER. —Edward G. Worley, New York, N. Y.

313,465. SUSPENDED SCAFFOLD. — John Worsley, Chester Pa.

SUMMARY OF THE WEEK.

Baltimore.

FACTORY. — George Archer, architect, has prepared drawings for the Estate of Thos. Wilson, for a one and three st'y frame factory, 75' x 150', to be built at Canton, for the Poppleir Silicated Phosphate Company; John Haswell, builder.

DWELLING. — Wm. H. Marriott, architect, is building a two-st'y and attic frame dwell., 36' x 42', on Charles-street Ave., to cost $4,500.

BUILDING PERMITS. — Since our last report thirty-four permits have been granted, the more important of which are the following:—

Wm. H. Fowler, 4 three-st'y brick buildings, s s John St., between Bond and Broadway.

C. A. Pindell, 4 three-st'y brick buildings, w s Argyle Ave., n of Lanvale St., and 4 two-st'y brick buildings, e s Shields Alley, in rear.

Samuel B. Derr, 3 three-st'y brick buildings, commencing n e cor. Linden Ave. and Robert St., and 4 three-st'y brick buildings, n s Robert St., in rear of above.

C. Franke, three-st'y brick building, e s Gay St., between Caroline and Dallas Sts.

L. F. Bowen, 12 two-st'y brick buildings, e s Carter Alley, between Lanvale and Townsend Sts.

H. P. McGrath & Co., three-st'y brick warehouse, on right of way.

D. C. Howell, 9 three-st'y brick buildings, e s Foster Alley, s of Lanvale St.

Longmain, Straine & Co., 12 two-st'y brick buildings, e s Washington St., commencing s e cor. Federal St.

John Keeper, 2 three-st'y brick buildings, n e cor. Hollins and Stricker Sts., and 4 three-st'y brick buildings, e s Stricker St., n of Hollins St.

W. F. Stubbs, 19 two-st'y brick buildings, n e s Cross St., between St. Peters Street and Columbia Ave.

Jas. Connaughton, three-st'y brick building, e s Jasper St., n of Franklin St.

J. Vancollen, three-st'y brick building, s s Gay St., between Chew and Caroline Sts.

W. E. Wood & Co., 12 two-st'y brick buildings, e s Sassafras St., s of Cross St.

Walter W. Watts, 44 two-st'y brick buildings, w s Garrett Ave. and n and s of Clement St.

A. A. White, three-st'y brick building, w s North St., s of Townsend, and stable in rear.

Jacob Saum, 8 three-st'y brick buildings, s s North Ave., between Eutaw Pl. and Linden Ave.

Peter Flaherty, etc., 3 two-st'y brick buildings, w s Duncan Alley, between Fayette and Orleans Sts.

F. E. Yewell, 32 two-st'y brick buildings, s s Washington Road, between Bayard and Bush Sts., 24 two-st'y brick buildings, n s Ward St., between same, and 7 two-st'y brick buildings, w s Bayard St.

Boston.

BUILDING PERMITS.—*Brick.—Chapman Pl.*, cor. Bosworth St., dwell. and store, 8' x 50'; A. C. Russell, owner; John Mack, builder.

Adams St., cor. Dorchester Ave., halls and offices, 40' x 75'; Henry Fields, owner; McNeil Brothers, builders.

North Centre St., No. 12, mechanical-building, 34' x 98'; C. M. Hurd, owner; A. Hataway, builder.

Brooklyn.

BUILDING PERMITS. — *Schenck St.*, w s, 109' 9" s De Kalb Ave., 10 four-st'y brown-stone flats, tin roofs; cost, each, about $12,000; owner, Thos. H. Brush, Fourth Ave., cor. Flatbush Ave.; architect, F. E. Lockwood.

York St., s s, 25' w Charles St., three-st'y and cellar brick store and tenement, tin roof; cost, $4,500; owner and architect, John Witte, 186 York St.; builders, John Kolle and Jno. Stabler.

Monroe St., n s, 250' w Sumner Ave., 5 two-st'y brick dwells., tin roofs; cost, each, $4,800; owner, architect and builder, Daniel B. Norris, 359 Clifton Place.

Evergreen Ave., w s, 60' s Montieth St., three-st'y brick ice-house; gravel roof; cost, $12,000; owners, S. Liebmann's Sons, Forrest St., near Bremen St.; architect, Th. Engelhardt; builder, U. Maurer.

Hope St., n e cor. Sixth St., five-st'y and basement brick factory, tin roof; cost, $22,000; owner, James Cavanagh, 54 South Sixth St.; architect, C. C. Buck.

Stanhope St., No. 55, n s, 250' e Evergreen Ave., two-st'y frame (brick-filled) dwell., tin roof; cost, $3,000; owner and builder, E. C. Bauer, 22 Stanhope St.

Rockaway Ave., n w cor. Atlantic Ave., 2 four-st'y brick stores and tenements, tin roofs; cost, each, $3,500; owner, Peter H. Ahlers, 385 Atlantic Ave.; architect, B. H. Ahlers.

Gwinett St., Nos. 95, 97 *and* 99, n s, 3 three-st'y brick tenements, two with stores, tin roofs; cost, $5,500; owners, Marx & Wachschlager, rear of above premises; architect, H. Vollweiler.

Bushwick Ave., e s, 50' s Prospect St., four-st'y frame (brick-filled) stores and tenement, tin roof; cost, $5,000; owner, Jacob Klein, 149 Bushwick Ave.; architect, H. Vollweiler.

South Ninth St., No. 213, being 75' e Sixth St., three-st'y brown-stone dwell., tin roof; cost, $9,000; owner, Richard Malone, 26 South Sixth St.; architect, E. F. Gaylor; builders, Thos. Gibbons and S. M. Weeks.

Gwinnett St., No. 136, s s, 122' e Harrison Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner and architect, G. Nitzer, on premises.

Duryea St., s s, 225' e Broadway, two-st'y frame (brick-filled) dwell., tin roof; cost, $3,000; owner, C. de Loraine, 1155 Broadway; architect and builder, C. L. Johnson's Sons.

Union St., s s, 80' w Fifth Ave., one-st'y brick rink, felt and sand roof; cost, $15,000; owner, John Devlin, Fulton St.; architect, E. F. Gaylor; builders, F. & J. Kelly and Jno. Fallon.

Schenck St., Nos. 11 *and* 13, e s, 100' s Flushing Ave., four-st'y brick factory, tin roof; cost, $20,000; owner, P. Frederick Lenhart, 88 Classon Ave.; architect, G. W. Anderson; builder, J. D. Anderson.

Heyward St., n s, 80' w Bedford Ave., 5 three-st'y brick tenements, tin roofs; cost, each, $8,000; owner and builder, Richard Healy; architect, I. D. Reynolds.

Monroe St., n s, 197' e Throop Ave., 5 two and three st'y dwells., tin roofs; cost, each, $5,000; owner, Henry de Zavala, 411 Monroe St.; architect and builder, George B. Stoutenburg.

Sumner Ave., s e cor. Ellery St., three-st'y frame store and tenement (brick-filled), tin roof; cost, $5,450; owner, Mr. Gross, 75 Debevoise St.; architect, H. Vollweiler.

Adams St., s s, 100' w Evergreen Ave., three-st'y frame tenement (brick-filled), tin roof; cost, $5,000; owner, Michael Munz, 171 Myrtle St.; architect, H. Vollweiler.

Nineteenth St., s s, 325' e Sixth Ave., four-st'y brick tenement, tin roof; and *Twentieth St.*, n s, 325' e Sixth Ave., four-st'y brick tenement, tin roof; total cost, $18,000; owner, John Weeber, 25 Willow Pl.; architects, M. Freeman's Sons; builders, J. J. Cody and M. Freeman's Sons.

Twenty-second St., n s, 160' e Fifth Ave., three-st'y brick schoolhouse, tin roof; cost, $10,000; owner, St. John Roman Catholic Church, 250 Twenty-first St.; architect, Wm. Schickel.

Jefferson St., s s, 290' e Throop Ave., 12 three-st'y brown-stone dwells., felt and gravel roofs, wooden cornices; cost, each, $5,000; owner and architect, Wm. V. Studdiford, 82 Woodhull St.

Monroe St., s s, 267' w Reid Ave., 2 two-st'y brick dwells., tin roofs, wooden cornices; cost, each, $4,000; owner, etc., Thomas Miller, 650 Monroe St.

ALTERATIONS. — *Lefferts Pl., No.* 119, one-st'y brick extension, tin roof, brick cornice; cost, $5,000; owner, Joseph H. Bearns, on premises; architect, J. Kastner; builder, not selected.

Chicago.

HOUSES. — Burling & Whitehouse, architects, have plans ready for a three-st'y dwell., 66' x 84', at n w cor. of Michigan Ave. and Thirty-third St., for J. Cudahy; to be constructed of Connecticut Longmeadow stone; cost, $125,000.

BUILDING PERMITS. — E. Ganot, three-st'y dwell., 325 Twenty-second St.; cost, $6,000; builder, W. Reinert.

Board of Education, three-st'y schoolhouse, 161 North Sangamon St.; cost, $32,000; architect, J. J. Flanders.

H. Jordan, three-st'y store and flats, 883 Polk St.; cost, $5,500; architects, Strippelman & Co.

J. F. Walsh, stable, 90 North Market St.; cost, $5,000.

Backenhues & Muessler, four-st'y factory, 95 and 97 Indiana St.; cost, $10,000; architect, F. Keltenick.

Wm. Haffmayer, two-st'y dwell., 2727 Portland Ave.; cost, $2,700.

J. Raber, three-st'y store and dwell., 2296 State St.; cost, $8,500; architect, J. Frank.

C. O'Shea, two-st'y dwell., 809 West Indiana St.; cost, $3,500.

H. Simons, two-st'y dwell., 523 West Congress St.; cost, $5,000; architects, Wheelock & Clay.

J. T. Stewart, 3 cottages, 664 to 670 Rockwell St.; cost, $2,700.

D. C. Starrett, two-st'y dwell., 927 Thirty-eighth St.; cost, $2,500.

G. Watson, five-st'y warehouse, 121 and 123 Michigan St.; cost, $26,000.

W. M. Dee, three-st'y store, 22 Quincy St.; cost, $7,000; architect, W. A. Furber.

G. A. Johnson, three-st'y store and flats, 938 West Lake St.; cost, $5,500; architects, Wilson & Moody.

P. Adams, three-st'y store and flats, 357 Hurlbut St.; cost, $3,000; architect, A. G. Boes.

J. Samuel, two-st'y dwell., 129 Osgood St.; cost, $2,500.

H. M. Kinsley, four-st'y restaurant-building, Adams St.; cost, $125,000; architect, F. L. Charnley.

J. Banholzer, three-st'y store and flats, 133 West Randolph St.; cost, $7,000; architect, E. Sarbell; builders, Lund & Gilbert.

G. Ludwig, two-st'y store and flats, 106 Smith St.; cost, $5,000; builder, F. Kirchoff.

W. H. Aldrich, 2 three-st'y flats, 49 and 51 Ann St.; cost, $14,000; architect, J. Vigant.

P. Clifford, two-st'y dwell., 184 North Wood St.; cost, $2,600; builder, J. McGee.

Wm. Anderson, two-st'y dwell., 3029 Portland Ave.; cost, $4,000.

G. Viehweg, three-st'y factory, 266 and 268 Clinton St.; cost, $10,000.

J. Bobka, three-st'y store and dwell., 657 Throop St.; cost, $8,000.

W. Goldsmith, 2 three-st'y flats, 316 and 318 North State St.; cost, $8,000; architect, F. H. Waschor; builder, L. Weick.

J. John, 2 two-st'y stores and flats, 546 West Madison St.; cost, $2,500; architect, M. L. Bears; builders, G. Lehman & Son.

New York.

FLATS. — For Mr. John D. Raest, Jr., 2 five-st'y flats, with stores, 25' x 70' each, are to be erected on the w s of Third Ave., near One Hundred and Third St., at a cost of about $30,000, from designs of Messrs. Hugo Kafka & Co.

A five-st'y flat, of stone, brick and terra-cotta, 25' x 89', is to be built at No. 117 East Fifty-third St., at a cost of $22,000, for Mrs. Jane E. Cusick, from designs of Mr. R. Rosenstock.

For Mr. Mark Rinaldo, 4 five-st'y brick, stone and terra-cotta flats, 25' x 90' 6" each, are to be built on the n s of Thirty-third St, 81' e of Third Ave., to cost $100,000, from plans of Messrs. A. B. Ogden & Son.

HALL. — For the Washington Heights Building Association, Mr. Carl Pfeiffer is preparing plans for a 75' x 100' building for a bank, library and club-rooms, to be built on Tenth Ave., between One Hundred and Fifty-sixth and One Hundred and Fifty-seventh Sts., at a probable cost of about $40,000.

STORES.—On the n e cor. of Broadway and Fifty-third St., 5 brick and stone-trimmed stores, about 20' x 80' each, are to be built for Mrs. C. Rusch, from designs of Mr. Chas. C. Haight.

BUILDING PERMITS. — *Broome St., No.* 438, five-st'y brick store, tin roof; cost, $30,000; owner, Miss Jane Major, 147 Second Ave., and others; architect and builder, E. Kilpatrick.

Cherry St., No. 336, five-st'y brick tenement, tin roof; cost, $16,000; owner and builder, John Totten, 240 West Forty-ninth St.; architect, M. Louis Ungrich.

East Houston St., Nos. 327 *and* 329, 2 five-st'y brick tenements, tin roofs; cost, each, $19,000; owner, Solomon Jacobs, 195 East Broadway; architect, Henry Herter.

East Broadway, No. 94, six-st'y brick tenement, tin roof; cost, $14,000; owner and architect, same as last.

King St., No. 4, five-st'y brick tenement, tin roof; cost, $9,000; owner, Amelia M. Large, 679 Greene Ave., Brooklyn; architects, Gilbert & Thompson.

Ludlow St., No. 69, three-st'y brick synagogue, tin roof; cost, $18,000; owner, Congregation of Beth Hamedrish Hadogal, Meyer Freeman, President, 32 Ludlow St.; architect, Wm. Graul.

Mulberry St., No. 126, five-st'y brick store and tenement, tin roof; cost, $9,500; owner, Joseph L. Schofield, West Farms, Twenty-fourth Ward; architect, A. Spence.

Norfolk St., No. 29, five-st'y brick tenement, tin roof; cost, $18,000; owner, Morris Rosendorff, 50 Eldridge St.; architect, Chas. Rentz.

East Fourth St., No. 81, five-st'y brick tenement, tin roof; cost, $18,000; owner, Wm. Pilgrim, 75 East Third St.; architect, Jobst Hoffmann.

Forty-sixth St., n s, 443' 6" w Eighth Ave., 8 three-st'y and basement brown-stone front dwells., tin roofs; cost, each, $12,500; owner, John Livingston, 981 Lexington Ave.; architect, F. T. Camp.

Ave. A, e s, 75' s Fifty-seventh St., five-st'y brick brewery, tin roof; cost, $20,000; owners, Schmidt &

Schwaoenfluegel, 163 East Fifty-ninth St.; architects, A. Pfund & Son.

Ave. A, e s, 75′ s Fifty-seventh St., one-st'y brick boiler-house, tin roof; cost, $4,000; owners, Schmidt & Schwanenfluegel, 163 East Fifty-ninth St.; architects, A. Pfund & Son.

West Seventeenth St., Nos. 321 *and* 323, 2 five-st'y brick tenements, tin roofs; cost, each, $15,000; owner, George Shepherd, 322 West Twenty-second St.; architect, Jos. M. Dunn; builders, N. Andruss and O. T. Mackey.

East Nineteenth St., No. 202, two-st'y brick dwell., gravel roof; cost, $3,000; owner, Aaren Herschfeld, 156 East Seventy-ninth St.; architect, P. H. Spelman; builders, Spelman & Co.

Seventy-third St., n s, 87′ 6″ w Fourth Ave., 5 four-st'y brick and stone dwells., tin and slate roofs; cost, $20,000 to $23,000 each; owner and architect, John G. Prague, 47 Bible House.

One Hundred and Fourth St., n s, 18′ w Fourth Ave., 4 three-st'y and basement brown-stone front dwells., tin roofs; cost, each, $8,000; owner, architect and builder, Wm. Fernschild, 324 East One Hundred and Fourteenth St.

One Hundred and Tenth St., n s, 52′ e Lexington Ave., one-st'y brick carriage-house, tin roof; cost, $13,000; owner, John H. Fiedeman, cor. Lexington Ave. and One Hundred and Tenth St.; builder, Henry Antonius.

ALTERATIONS. — Mr. Wm. Schaus, of Fifth Avenue, will have his residence altered and an art-gallery added, from designs of Mr. G. Martin Huss.

The Stock Exchange will have only some trifling interior alterations made from plans of Mr. I. R. Thomas.

The piano-factory of Messrs. Sohmer & Co., on the n w cor. of Fourteenth St. and Third Ave., is to be altered at a cost of $10,000, from plans of Messrs. Berger & Baylies.

Front St., No. 2, raise one and a half st'y, new flat roof; cost, $4,500; owner, estate of D. V. H. Floyd, Wm. Cruikshank, agent, 3 Pine St.; architect, W. H. Berrian.

Forty-second St., Nos. 231 *and* 235, upper story walls, front and rear rebuilt; cost, $20,000; owner, R. W. de Forest, exr., estate Ben. Wakeman, 120 Broadway; architect, A. Namur; builders, V. J. Hedden & Sons.

Third Ave., n e cor. Eighty-first St., four-st'y brick extension, tin roof, interior alterations, and front rebuilt; cost, $10,000; owner, Matthew Murphy, 200 East Twenty-eighth St.; architect, M. C. Merritt.

Orchard St., No. 20, one-st'y brick extension, tin roof, interior alterations, etc.; cost, $3,500; owner, Isaac Schenker, 20 Essex St.; architect, Wm. Graul.

First Ave., n e cor. Fifty-seventh St., four-st'y brick extension, tin roof, alteration, basement and tenement above; cost, $11,000; owner, Chas. Zebbardi, First Ave., s e cor. Fifty-eighth St.; architect, Max. Lehroff.

Bowery No. 40, one-st'y brick extension, tin roof; cost, $5,000; owner, L. Reinken, 42 Bowery; architect, J. Hoffman.

Madison St., No. 112, altered to a full three-st'y flat, new iron stoop, and other iron-work; cost, $3,000; owner, Isaac Rinaldo, 52 Catharine St.; architects, Ebeling & Heinike.

Tenth Ave., Nos. 927–931, five-st'y brick extension, altered to stores and tenements, fronts rebuilt, etc.; cost, $12,000; owner of Nos. 927 and 929, Henry Schweckendick, 322 Tenth Ave.; owner of No. 931, Emil C. G. von Pein, 824 Tenth Ave.; architect, Jas. W. Cole; builder, J. Jordan.

Philadelphia.

MANUFACTURING BUILDING. — H. Muhr & Sons are about erecting a building for manufacturing purposes at the south-west corner of Broad and Race Sts. The building will be in the form of the letter L, six stories in height, with a basement, and will have a frontage on Broad St. of 100′, and extend in depth 140′ on Race St. with a width of 45′, and a wing at the west end of the lot the same height, 54′ 6″ in length and 45′ in width. The front of the building will be of selected stretchers laid in red mortar; the base will be rock-face and sandstone; the window, door and pilaster trimmings will be blue marble. The building will have three projecting towers at the corners 105′ high. The entrance to the yard area, a space of 51′ x 65′, is on Race St., and is guarded with heavy iron gates. The power will be transmitted to each floor by means of large pulleys entirely enclosed in a brick belt or pulley shaft extending the entire length of the building, and so arranged that it can be detached on any floor at will. The engine employed will be 100 horse-power, and the boilers 180 horse-power. The entire building will be provided with the electric light. Walter Geissenger is the architect and will superintend the erection.

BUILDING PERMITS. — *Terrace St.*, n w cor. Seville St., three-st'y dwell., 24′ x 56′; Patrick Powers, owner.

Foulkrod St., below Tackawanna St., two-st'y dwell., 16′ x 30′; M. E. Mabrey, contractor.

Huntingdon St., below Fourth St., 4 two-st'y dwells., 15′ x 42′; Clancy & Stewart, contractors.

Fourth St., s w cor. Huntingdon St., three-st'y dwell., 16′ x 55′; Clancy & Stewart, contractors.

Huntingdon St., s w cor. Ormes St., three-st'y dwell., 15′ x 50′; Clancy & Stewart, contractors.

Huntingdon St., below Fillmore St., 2 two-st'y dwells, 14′ x 42′; Elizabeth Hanson, owner.

Vine St., No. 518, four-st'y store, 21′ x 100′; Yarnall & Cooper, contractors.

Warnock St., below Somerset St., 6 two-st'y dwells., 12′ x 40′; L. K. Slifed, contractor.

Thirtieth St., below Poplar St., 10 two-st'y dwells., 15′ x 46′; Wm. H. Bilyue, contractor.

Brown St., w of Thirteenth St., 5 three-st'y dwells., 12′ x 30′; Wm. Holloway, owner.

Atmore St., w of Thirteenth St., 3 two-st'y dwells., 12′ x 30′; Wm. Holloway, owner.

Twenty-fourth St., e e cor. Brown St., three-st'y store and dwell., 20′ x 48′; I. Black, contractor.

Palethorp St., Nos. 2531 *to* 2541, 6 two-st'y dwells., 14′ x 30′; Patrick Nolan, owner.

Thirty-first St., cor. Stiles St., 17 two-st'y dwells. Wm. Steele, contractor.

Second St., below Indiana Ave., e s, two-st'y factory, 50′ x 100′; Wm. Steele, contractor.

Franklin St., above Cumberland St., 17 two-st'y dwells., 15′ x 44′; M. L. Heist, owner.

East side of 8th St., above Cumberland St., 6 two-st'y dwells., 15′ x 45′; M. L. Heist, owner.

Market St., Nos. 610 *and* 612, 5 st'y addition to store: Jas. B. Doyle, Contractor.

St. Louis.

BUILDING PERMITS. — One hundred and thirteen permits have been issued since our last report, twenty-five of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows:—

F. W. Risque, three-st'y brick dwell.; cost, $5,000; Kirchner & Bro., architects; B. Stock, contractor.

D. Broemswig, two-st'y brick store and dwell.; cost, $5,000; Jno. H. Frye, contractor.

Mrs. R. S. Caldwell, two-st'y brick dwell.; cost, $3,500; J. B. Legg, architect; S. S. Jones, contractor.

J. D. Macadaras, 4 adjacent two-st'y brick tenements; cost, $4,500; George I. Barnett, architect; O'Malley Bros., contractors.

J. D. Macadaras, 4 adjacent two-st'y brick tenements; cost, $4,500; George I. Barnett, architect; O'Malley Bros., contractors.

J. D. Macadaras, 3 adjacent, two-st'y brick stores and tenements; cost, $3,000; George I. Barnett, architect; O'Malley Bros., contractors.

Joseph Grumminger, two-st'y double brick tenement; cost, $3,600; Berkemeier & Rieckmann, contractors.

Theresa Bunn, two-st'y brick dwell.; cost, $3,500; Wm. Whiting, contractor.

Martha Obrecht, two-st'y brick dwell.; cost, $2,900; Wm. Whiting, contractor.

Wm. Whiting, two-st'y brick dwell.; cost, $2,700; Wm. Whiting, contractor.

Francis Flynn, two-st'y double brick dwell.; cost, $4,500; T. J. Gunn, contractor.

Thomas Roach, two-st'y brick dwell.; cost, $2,500; T. Roach, contractor.

J. G. Brandt, altering four-st'y brick stores; cost, $5,000; A. Beinke & Co., architects; Diestelkamp & Bros., contractors.

R. S. Stevenson, 3 adjacent two-st'y brick dwells. cost, $9,000; T. H. Goss, contractor.

T. F. Maloney, 3 two-st'y double dwells.; cost, each, $6,000; T. H. Goss, contractor.

T. J. Quinn, two-st'y double dwell.; cost, $6,000; T. H. Goss, contractor.

B. Spellbrink, two-st'y brick dwell.; cost, $3,000; T. H. Goss, contractor.

Henry Schaub, two-st'y brick dwell.; cost, $3,700; B. Heber & Co., contractors.

Henry Goodman, two-st'y brick dwell.; cost, $3,000; Milburn & Rich, contractors.

A. Whri, two-st'y brick tenement; cost, $3,000; A. Whri, contractor.

Charles H. Turner, two-st'y brick car-stable; cost, $22,000; Milburn & Rich, contractors.

P. T. Clarke, 2 adjacent two-st'y brick dwells.; cost, $5,000; Jas. H. McNamara, architect; Jno. J. McMahon, contractor.

Jas. Martland, 2 adjacent two-st'y brick tenements; cost, $5,000; C. F. Aufderheide, contractor.

D. K. Ferguson, three-st'y brick store and dwell.; cost, $6,500; H. Grable & Co., architects; R. P. McClure, contractor.

F. W. Obermeyer, 2 adjacent two-st'y dwells.; cost, $6,000; Chas. May, architect; Burman & Alwing, contractor.

Charles Wunderlick, two-st'y double brick tenement; cost, $2,600; Burnam & Alwing, contractors.

J. H. Bruggermann, two-st'y brick dwell.; cost, $4,500; Wm. Gahl, contractor.

Louis Seidel, two-st'y brick dwell.; cost, $4,300; E. Janssen, architect; Remmers & Thompson, contractors.

John Gruen, two-st'y brick dwell.; cost, $4,300; E. Janssen, architect; Remmers & Thompson, contractors.

Britton A. Hill, two-st'y brick tenement; cost, $3,000; L. Anslyne, contractor.

Henry H. Vogt, two-st'y brick dwell.; cost, $5,400; W. Kerksieck, contractor.

C. Urnply, two-st'y brick dwell.; cost, $6,000; C. Urnply, contractor.

M. & J. Devlin, 2 adjacent two-st'y brick dwells.; cost, $3,000; F. Bayer, contractor.

G. Meyer, 3 adjacent two-st'y brick stores; cost, $8,500; Kirchner & Bro., architects; J. V. Majors, contractor.

Chas. H. Turner, one-st'y car-shed; cost, $8,000; Milburn & Rich, contractors.

J. A. Harris, two-st'y brick dwell.; cost, $3,025; Aufderheide & Dekemper, contractors.

H. Temme, two-st'y brick stable; cost, $2,500; Jas. Stewart, architect; C. H. Poertner, contractor.

J. C. Engel, two-st'y brick dwell.; cost, $3,500; B. J. Goesse, architect; C. H. Poertner, contractor.

Henry Bostelmann, two-st'y brick dwell.; cost, $2,800; C. H. Poertner, contractor.

J. E. Ryan, 3 adjacent two-st'y brick dwells.; cost, $4,500; T. W. Brady, architect; J. F. Leuergan, contractor.

C. Brochmeier, two-st'y brick store and tenement; cost, $4,000; Henry Franke, contractor.

J. M. Figusa, two-st'y brick tenement; cost, $3,500; T. J. Kelly, contractor.

Phil. Florreich, two-st'y brick tenement; cost, $3,000; G. Hubert, contractor.

J. Adams, 3 adjacent two-st'y brick dwells.; cost, $6,500; contract sublet.

J. Adams, two-st'y brick store and dwell.; cost, $3,000; contract sublet.

J. Neuhaus, one-st'y brick dwell.; cost, $2,500; F. Knittel, contractor.

A. Schroeder, altering a two-st'y brick dwell.; cost, $2,600; F. Knittel, contractor.

F. A. Brinkmeyer, two-st'y brick dwell.; cost, $8,000; H. Brinkmeyer, contractor.

H. A. Parker, 3 two-st'y brick dwells.; cost, each, $4,400; S. H. Hoffmann, contractor.

Sovenz Meyer, 2 adjacent two-st'y brick tenement; cost, $3,500; H. Hoffmeyer, contractor.

St. Paul, Minn.

BUILDING PERMITS.—*St. Peter St.*, three-st'y brick store; cost, $8,000; Chas. Horst, owner; D. W. Millard, architect.

West Seventh St., three-st'y brick block; cost, $15,000; owner, Geo. Rochate; architect, W. H. Castner.

Summit Ave., two-st'y frame dwell.; cost, $5,000; owner, Capt. Chas. E. Davis.

Toledo.

DWELLING-HOUSES.—For John Berdan, Esq., two-st'y and basement dwell., built of pressed-brick, with cut-stone finish; designed by E. O. Fallis & Co.

Frame house for T. D. Parker, Esq.; cost, $4,000; E. O. Fallis & Co., architects.

Dwell. for E. B. Hall, Esq., cor. Eighteenth and Monroe Sts.; cost, $8,000; E. O. Fallis & Co., architects.

INSANE ASYLUM.—Toledo Insane Asylum, thirty-six buildings under contract; accommodations for one thousand patients; built upon the pavilion plan, foundations partly in; probable cost, $600,000; designed by E. O. Fallis and J. W. Yost.

SCHOOL-BUILDING.—Toledo Manual Training School; cost, $30,000; E. O. Fallis & Co., architects.

COMPETITION.

LADIES' COLLEGE. [At Montreal, Can.]

22 ST. JOHN STTEET,
MONTREAL, February 20, 1885.

The Trustees of the Trafalgar Institute, being desirous of erecting a building for the purposes of a ladies' college, invite architects to submit plans and estimates for the same.

Full particulars as to site, etc., can be had by applying to the undersigned.

Plans, etc., to be submitted **not later than 1st of April next.** ALEX. F. RIDDELL,
482 Secretary Trafalgar Institute.

CITY-HALL. [At Richmond, Va.]

February 16, 1885.

Proposals are invited **until June 1st, 1885**, for furnishing designs for a city-hall upon which premiums will be paid as follows: —

For first best design, $700.

For second best design, $300.

The Committee on Grounds and Buildings of the City Council reserves the right to reject any and all designs.

For information address the undersigned.

487 W. E. CUTSHAW, City Engineer.

TORONTO COURT-HOUSE. [At Toronto, Ont.]

CITY CLERK'S OFFICE,
TORONTO, ONT., March 4, 1885.

CHANGE OF TIME AND CONDITIONS.

Notice is hereby given that the following amendments have been made to the Instructions to Architects previously issued, viz.: —

(1) That the clause providing for the building being erected in Canadian material be struck out.

(2) That all designs for which premiums are awarded shall be and remain the property of the designer, instead of becoming the property of the city, except the one which is accepted for the erection of the building.

(3) That no prize be awarded to any plan the carrying out of which will exceed $200,000.

(4) That the time for the reception of plans be extended **until the 23d of April, 1885.**

JOHN BLEVINS,
482 City Clerk.

PROPOSALS.

ELEVATORS. [At Cincinnati, O.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., February 28, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 28th day of March, 1885**, for furnishing and erecting complete, in the custom-house and post-office building at Cincinnati, O., two hydraulic passenger-elevators, two mail-elevators, and one ash-lift, in accordance with drawings and specification, copies of which and any additional information may be had on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check for $1,000, drawn to the order of the Secretary of the Treasury, as a guarantee that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered. M. E. BELL.
482 Supervising Architect.

STONE AND BRICK WORK. [At Denver, Col.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., March 12, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 13th day of April, 1885**, for furnishing the labor and materials, and building complete the stone and brick masonry of walls of superstructure of the court-house and post-office building at Denver, Col., in accordance with drawings and specification, copies of which may be seen and any additional information obtained at this office or the office of the superintendent.

Bids must be accompanied by a certified check, drawn to the order of the Secretary of the Treasury, as a guarantee that the bidder will enter into a contract if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered. M. E. BELL,
483 Supervising Architect.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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MARCH 28, 1885.

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AFTER debating for some time the question how we could best take advantage of our opportunities and facilities to promote the interests of architecture in this country, we have decided that one of the most seemingly promising ways open to us is to publish from time to time a series of what may be called "Monographs of American Architecture," and we now announce the speedy publication of the first of the series. The subjects of these monographs will probably at first be the same buildings that are published as gelatine plates in our gelatine edition — but at a larger scale — shown both in general views and in detail. Of these details there will be in each case as many as the architectural features of the building may warrant, — a variable quantity with each building, so that the number of plates belonging to each monograph will sometimes be more or less than those in the preceding issues, and consequently it is quite probable that the price will be adjusted to each case. As to this, since our purpose is not to publish *editions de luxe*, but something of value to poor as well as rich architects — if there be such — we can at this stage of proceedings only say that the price will be as moderate as possible. The first monograph will be Austin Hall, which is published as a gelatine plate with this issue, and will be illustrated by eighteen gelatine plates.

WE have not much fear that there is any truth in the rumor that General Rosecrans is to be rewarded for "party service" by superseding as architect of the Capitol, Mr. Edward Clark, the present incumbent, who has held the position undisturbed for many years, discharging the duties he has been called on to perform — the completion of unfinished portions, the alterations of the legislative chambers, and the designing of new work — to the *marked* acceptance of every one. Not only would such a substitution be contrary to what, on general principles, might be expected of President Cleveland, but he has as Governor of New York had unusual facilities for learning what qualifications are likely to be desirable in the architect of a great public building, and by his treatment of the questions concerning the Albany Capitol submitted to him as Governor, he has shown that he has appreciated them at their proper value. No hint that Mr. Clark was considered by any one as not entirely qualified for the position, or that he could in any way be considered as holding a political office, and therefore subject to removal, has ever reached us. If it had been General Meigs who had been mentioned as Mr. Clark's successor there would have been a reasonableness about the suggestion which the present one lacks, for it would be in his case, in a sense, the resumption of an interrupted task. No, a great public building is as susceptible of disease, and resents the application of improper cures, as much as does the human body, and to entrust it to a political war-horse every fourth year would be as fatal as to attempt to prolong life by living on the nostrums of a quack changed every four years.

ONE result of the recent burning of a private house in Philadelphia, which caused the death of all but one of the inmates, was the extraordinary demand that followed for life-ropes, fire-extinguishers, hand-pumps, and all the make-shift safeguards which exist because safe buildings do not. The temporary effect of the burning of the Langham Hotel, at Chicago, Ill., last Saturday, at which, thanks to its occurring early in the evening, only five or six persons lost their lives, may be somewhat similar, but permanent effect there will be none. Other buildings, elsewhere if not in Chicago, never intended for hotels, will be altered so as to form huge caravansaries with labyrinthine passages, as in this case; with eight or ten wood-lined air-shafts, as in this case, and heated by stoves in the lower story, whose smoke-pipes, as in this case, will traverse partition after partition, till they reach the chimney ascending alongside the elevator-shaft. Self-interest is the target at which to aim, and though public opinion and the most enlightened of the insurance companies are doing something to encourage better building, it makes one ache to think how slow the progress is. Some philanthropist with plenty of money to risk in defending libel suits might do a deal of good by ferreting out such fire-traps and mercilessly exposing them in the newspapers, not only once, but again and again, till the publicity has affected the owner's pocket and at last he sees that the alternatives are ruin or reconstruction. It might not be a wholly bad plan to authorize building inspectors to advertise such places in the daily papers continuously as notoriously unsafe. Almost anything would be better than the cruel destruction of life and property that goes on year after year, almost unchecked.

THE second annual competition for the Rotch Travelling Scholarship will begin at the Museum of Fine Arts, Boston, on Saturday, April 4, at nine o'clock, and, as before, will be open to young men under thirty years of age who have been employed for two years at least in the offices of Massachusetts architects. In general the examinations will be conducted on the same line as last year; but in one point a change, an advantageous one, has been made: the aspirants admitted to the final competition in design will be allowed but two weeks in which to work out their *projet*, and, as a consequence, their anxiety and the strain under which some would probably work will be halved, while we believe that the temptation that was offered by the longer period of last year to prepare for and carry out elaborately finished drawings being now removed, the attempt will be more in the line of strict architectural effect than in that of mere draughtsmanship. The chance of winning the opportunity to spend two years in Europe ought to bring the best men to the front; and when he sees that the limit of age is fixed at thirty years, many a sedate married man may regret that he is not still a bachelor and free to try for the prize. If the winner this year will follow worthily the example set by the holder of the first scholarship, the founders should feel well satisfied.

A PAPER was recently read before the Conservatoire des Arts et Métiers in Paris, by Dr. Hector George, and reported by *Le Génie Civil*, on the early treatment of cases of accident to workmen. Notwithstanding all the precautions which are now taken in the best managed manufactories, an appalling number of such accidents occur every year, and their sad consequences might be greatly alleviated if all workmen were made familiar with the simple rules which Dr. George collected in his discourse. The first class of wounds treated of comprises those caused by crushing or tearing, such, for instance, as the result of striking a finger or thumb by a misdirected blow of a hammer, or of having the arm or hand caught in belts or gearing. The consequence of these accidents is usually a pounding and crushing of the flesh, and often of the bones, which is apt to result in mortification, and the common practice of surgeons in such cases is to amputate the injured member at once. According to Dr. George, however, if the patient is treated in time, the limb can often be saved by the simple application of water. During the period of the Napoleonic wars, to follow the doctor's story, while testing cannon at Strasbourg, eleven artillery-men were injured, either by the premature explosion of the guns or by the bursting of imperfect pieces, and were brought into the hospital together. The wounds, some of which were caused by the tearing of the hands by the explosion of guns while the cartridge was being rammed into place, while others were contusions from flying

pieces of bursting guns, were all serious, and a discussion took place among the surgeons as to the amputations to be performed. In the midst of this an Alsatian miller came in, and begged the privilege of treating the wounded, earnestly promising to cure them. He was allowed a trial, and immediately called for some water, into which he threw a little white powder, which was afterward found to be alum. He then proceeded to bathe the wounds with the water, accompanying his movements with mysterious gestures and muttered words of unknown import. After bathing the wounds thoroughly, he covered them with lint, and bandaged them well, first soaking the lint with the water, which he renewed by sprinkling every three hours. At the end of six weeks all the wounded were discharged, cured. Since that time the water treatment has been employed in similar cases by surgeons of great distinction, and with signal success. The application is very simple. Water of any kind may be used, without alum or incantations, only taking care that it is clean, and cool in summer and slightly warmed in winter. The wound is first to be carefully washed, and then covered with a wet linen bandage, or, what is better, a soft woolen material, thoroughly soaked, and with an inner bandage of linen to prevent the wool from irritating the wound. The bandages must be kept moist by frequent applications of a sponge or wet cloth. This constant soaking of the wound relieves the pain, and keeps the tissues in a favorable condition for healing. According to the account, the treatment is particularly advantageous for wounds in the hands, which form eighty-seven per cent of all the injuries caused by machinery.

THE next class of accidents mentioned comprises those which cause punctured wounds. Although less frightful in appearance than more extensive injuries, punctured wounds are often followed by serious, or even fatal consequences, through the poisoning of the system by infectious matters so introduced into the blood. Anatomists and medical students, as is well known, often lose their health, and sometimes their lives, from the results of an accidental scratch from a scalpel used in dissecting a subject, and butchers not unfrequently suffer in a similar way, particularly if they have been handling an animal infected with a contagious disease. In such cases, the old practice was to burn out the wound at once with a white-hot iron, or some less terrible caustic; but it seems that an effect equally favorable can be obtained by keeping the wound open and encouraging it to bleed. The extraction of the blood from the puncture is particularly necessary when the wound is first given, and the injured part should be held under a thin stream of tepid water, and the blood even sucked out by some self-sacrificing person, as is done by savages when one of their number is bitten by a venomous snake.

FOR burns, the doctor advises the application of cold water for a first application, with perhaps a coat of varnish later, to prevent the painful contact of air with the injured skin. Where the burn is deep, so that the skin is blistered, the utmost care must be taken in removing the clothes not to tear away the skin, which is likely to adhere strongly to the cloth; as the exposure of the nerves of the inner skin to the air by the removal of the epidermis causes pain so intense as often to prove fatal to the patient. If, by misfortune, the blistered epidermis should be torn, it must be restored to its place, piece by piece, or, if this is impracticable, an artificial skin must be at once applied, formed of oiled linen or paper, if nothing better can be had. If the materials are at hand, the best application is a mixture of equal parts of lime-water and olive oil, covered with fine linen and a piece of cotton batting; and as soon as these are applied, a physician must be sent for. We are rather surprised not to have found something in the paper about the application of common soda or saleratus to superficial burns. The liniment of lime-water and oil has a little of the same alkaline character, but neither of them is as easily procured, at least in most households, as the saleratus or soda which are known to relieve so effectually the pain of an ordinary burn.

IN cases of fracture, as, for example the breaking of the leg of a workman by falling from a stage, the first thing to be done is to lift the sufferer with great care, assigning one person to manage the injured limb. A blind, or board of some kind, is then to be slipped beneath, and the patient gently laid on it, placing a pillow under the broken leg, which should be extended at full length. He is then to be carried very gently, avoiding all jolts and collisions, to his house, remembering, in case it is necessary to take him up or down stairs, to keep his feet highest, so that the weight of the body may not come upon the injured member. Once at home, his clothes are to be taken off by ripping the seams, and the leg gently bandaged with wet linen, to await the surgeon's arrival. Lastly, for wounds which cause serious bleeding, attention must be given at once to checking this, since the loss of only two or three quarts of blood is fatal. The first thing to be done is to raise the bleeding part as high as possible, so that the weight of the blood may of itself draw it away from the open vein or artery. A simple bandage should then be applied, either above or below the wound, according as the blood is bright-colored and flows in pulsations, or is dark and flows uniformly, placing a stone or a knot in the bandage, if necessary, to press upon the spot where, as is found by testing with the finger, the flow seems to be best controlled. As soon as possible, the wound should be washed with clear water, and a wet linen cloth applied over it; and, as before, a surgeon's aid should be sought at once.

THE American Institute of Architects, or rather its New York Chapter, has had the misfortune to fall under the displeasure of the editor of the *Studio*, on account of its failure to condemn with what the editor considers sufficient emphasis the modelling of the statue of General Bolivar, which a number of ill-advised persons in South America, after going to a good deal of trouble and expense about the matter, have had the temerity to offer, as a token of their regard, to the citizens of New York. We know of no evidence that the design and workmanship of the statue are not highly creditable to the small and isolated country from which it comes, and, at least, they could not well be worse than those of the figures which are supposed to ornament the most public places in nearly all parts of the United States; but New York, although it possesses its full share of these decorations, is now guarded by persons who scrutinize all new acquisitions with a severity of criticism which would be commendable, if it did not occasionally overstep the bounds of discreet good taste.

IT is hardly necessary to say that the ideal of criticism to which the editor of the *Studio* holds is that of an assault which leaves its object floundering in the dust; and as the President of the New York Chapter of the Institute, who was officially asked for his opinion on the Bolivar statue, simply reported that it was "only moderately successful as a work of art," he is accused of failing in his duty to the public, which might, if Mr. Kendall had indulged in sufficiently fierce denunciations, have been excited to rise against the Park Commissioners, and compel the destruction or rejection of the statue. Although there would have been some interest in such a dramatic event as this, we think we can see several reasons why Mr. Kendall preferred not to be the leader of the movement. One of these probably was, that being asked a simple question, he chose to tell the truth in his answer; and the truth in this case is exactly expressed by the words of his reply. It is fatuous to say, as the *Studio* does, that "the Bolivar in the Central Park is not a man, and the beast he bestrides is not a horse." No one ever made such claims for any statue, and if the Bolivar monument looks something like a man mounted on a horse, it accomplishes everything in that respect that is to be expected of any piece of sculpture. Judged by our standard in such matters, the modelling of the horse is probably defective; but it could not be mistaken for a cow, and, considering how conventional and false our standard is, Mr. Kendall's report on this point expresses the precise truth, without exaggeration or mitigation. If the opinion of the New York Chapter had been asked as to the advisability of accepting and setting-up the statue, we are sure that every member would have joined in conceding that courtesy, gratitude and international kindness are occasionally as much to be regarded as the proportions of the costly present which is intended to give expression to these sentiments; but this subject was not proposed to them for discussion, and in answering the single question submitted to him, Mr. Kendall seems to us to have shown a wise sincerity which will tend to gain for him and the organization speaking through him increased influence among the public in matters of art.

THE DELLA ROBBIAS.[1] — II.



Medallion by Andrea Della Robbia from the Hospital of the Innocents, Florence. (From *L'Art.*)

TO make clear the value of Luca Della Robbia's artistic personality, I must begin a long way back, must note the influences which had been at work before his day, as well as the contrasting individualities which stood next his own.

Between the seventh and eleventh centuries, Italian sculpture was very poor in quality and by no means rich in quantity. In style it varied between a barbaric rudeness and a stiff Byzantine conventionality; and monumental work in stone was almost abandoned for decorative work in metal. The development of Romanesque architecture brought about a revival, but a revival which had less of originality and less of vigor than we find in contemporary work beyond the Alps. Architecture, the nursing mother of all the other arts, caused them to vary with her own varying desires. The southern architect loved breadth and repose where the northern loved animation and multitudinous detail; and he loved color more than form in decoration. Northern Romanesque depends for its decorative beauty upon form in sculptured figures and architectural details, Tuscan chiefly upon the hues of inlaid marbles and pictorial mosaics. The chisel's rôle was primary in the north, here it was but accessory.

Of architectural detail proper we find comparatively little, and such figure sculpture as there is takes the form of relief very much more often than the form of independent figures. At the beginning of the thirteenth century, when Niccolo Pisano was born, Italian sculpture could in no sense take rank with the Romanesque sculpture of the North, then just beginning, as it was to develop into its still more admirable Gothic phase.

Color, as I have said, was the chief love of the southern artist, and the field in which his greatest triumphs were achieved. And the remark is true not only of those early days when sculpture was actually neglected in its favor, but of the period of full development as well, of the period when the sun of the Renaissance, expanding the many-petalled flower of art, produced sculpture which stands second only to the Greek. For the painting then produced was, unless reasoning from analysis leads us very far astray, even greater than the painting of the Greeks: wonderful as was the bloom of Italian art beneath the chisel it was still more wonderful, and much more prolific beneath the brush. Yet, strangely enough, the art of Italy made each of its onward steps under the guidance not of the painter but of the sculptor. The very first step of all was made by Niccolo Pisano, and all along the later line we find his followers ever in advance of their brethren of the sister art. Strangely enough, I say, but only to the superficial eye, the eye which judges by ultimate results and not by their first causes. For the breath of inspiration came in the beginning from the relics of antiquity, and as these relics were carved, not painted, it is but natural that their lesson should have been learned first by the sculptor, and by him transmitted to the painter.

Niccolo Pisano is indeed the father of all Italian art. It is true that a distinct reaction followed upon his work and that his tendency, his ideals, afterwards to become all-powerful, seemed to fade for a time in face of another tendency, of ideals of another kind. He was a Classicist and his immediate successors were Gothicists. He cared most for beauty. They cared most for life and energy, for dramatic passion and emotional expression. But this fact, a knowledge of which is very necessary to our understanding of Italian sculpture, is nevertheless of secondary importance. The fact of prime importance is that Niccolo burst the chrysalis of art, that he freed sculpture on the one hand from the trammels of Byzantine convention, and saved it on the other from the license of undirected effort. The main facts are that he taught men that they might see with their own eyes, and that they ought to *choose* what things they would look at; and that the lesson was sympathetically received and fruitfully put in practice. It is but a secondary point, I repeat, that the master should have chosen to see the ancients, and his first followers should have chosen to see the body and soul of Christian man. History offers no more striking picture of an artist at once vitally influential and virtually isolated. Every chisel in Italy showed the effect of Niccolo's work, and yet in its character that work stood by itself. A few men before him seemed indeed to have aspired as he; but none had been able really to express their aspirations. And a few of his scholars tried to persist in his path, but their work is of almost no importance compared with the work of those who struck into another road, led by his own son Giovanni.

In his ideals and his tendencies, Niccolo was in fact before his time. The soil was not yet ploughed for that classic seed which later should find such fruitful fields. For one thing the age was still too Christian. A thoroughly Christian art cared, of necessity, wholly for story-telling, for dramatic expression, for the rendering of varied personal emotions; could care but very little for pure physical beauty, for the pure delighting of the eye. (The great French Gothic school, for instance, cared vastly for expression and vastly also for *architectural* beauty, but comparatively very little for *sculptural* beauty as the Greeks, as Niccolo, as the fifteenth-century Italians understood the term). The age was still too Christian and it was also, on the other hand, still too much excited and unsettled by the new life that was throbbing in its veins, by the new views of man and the world, of the *individual* in his many-sided powers and possibilities, that were opening out before it. Until this new life had somewhat crystallized — until the veils and motes and beams of mediæval prejudice, the fetters of mediæval asceticism had been swept away, until the modern man had learned to understand himself a little better — the proper balance between truth and beauty, between expression and form, which art demands could not be perceived. And until the Classic spirit in its general essence had been somewhat digested, the artist could not assimilate its qualities, he might try to *copy* the results of the antique, he could not *translate* its spirit into modern idioms of line and color. It was not strange that Giovanni and all his fellows of the fourteenth century should be dramatic in their treatment of their themes, naturalistic in their way of rendering Christian sentiment through moods and situations of intense emotion; the marvel was that Niccolo should have had so classic a love for beauty of form and for unemotional repose. It is not wonderful that he should have been an isolated artist; it is wonderful that he should have lived at all. It was inevitable that a reaction should come when he departed, inevitable and also most desirable. For had it been possible that a Classicizing Renaissance should base itself immediately on the Italian art of the thirteenth century, with its scant knowledge of inferior ancient relics and its scanter technical ability, had it not been prefaced by a long period when *nature* was the teacher, it would have been something very different from the Renaissance that we know. With the teaching of nature alone Italian sculpture might never have risen even to the height attained by the northern Gothic school; for it would have had less help from architecture. But with the teaching of the antique alone it could never have been more than a most imperfect copy of pagan art. The joining of both streams of influence was needed to make it what it was.

It is interesting to see how they both flow together through the centuries that divide Niccolo Pisano from Michael Angelo, nay from the latest of Venetians; neither ever wholly lost, though one and now the other predominates in the work of an individual, now one and now the other in the work of an entire school or epoch. And it is as interesting to trace them back and find that each starts in the work of one of "the Pisani." We cannot but compare the two, father and son, and mark their differences; cannot but contrast the classic, passionless, sculpturesque beauty in Niccolo's reliefs with the intense, energetic, expressive naturalism of Giovanni's. But one likes still better to think of them together as "the great twin brethren" who were the forerunners, the prophets, the teachers, in very truth the fathers of all that Italian art was ever to accomplish.

We must not forget that there was a direct special influence which, in combination with the general spirit of the age, worked to turn Giovanni away from his father's path. This was the influence of the Gothic of the north, absorbed, perhaps, during a journey beyond the Alps, more likely from certain German sculptors, who, we know worked in Italy when Giovanni was young. They were employed, for instance, with many Italians, upon the façade of the Orvieto cathedral; and the building well marks the epoch, since it is the first in Tuscany where sculpture — figure sculpture and architectural carving — plays at least an equal decorative part with color. The fourteenth century is the Gothic age of Italy, and the greater use of monumental sculpture was a natural consequence of northern influence. Yet it is almost impossible to say how large was the part directly played by the Pisani in its development. As architects their influence was very great, and extended over the whole length and breadth of Italy.[2] And had not Niccolo been the first to show his countrymen what the chisel might accomplish?

[1] Continued from page 127, No. 481.

[2] The rôle played by Niccolo and Giovanni Pisano in architecture does not concern us here, but it is as well worthy of consideration as the rôle they played in sculpture.

The stream of Classic influence seems weak throughout the fourteenth century, but we must not conceive of it as dry or stagnant, must not think that the claims of pure sculptural beauty were ever quite forgotten or denied. The time is perfectly expressed in Dante's writings. Dante, too, is chiefly Christian in sentiment, chiefly dramatic in treatment, but the growing importance of the human *individual* speaks from his every page, and the place, for instance which he gives to Virgil in his scheme tells the strength of the Classic influence very Clearly. It was the Classic influence, transmitted from the Romans, greatly reinforced by Niccolo, which made Italian sculptors always prefer the relief, at least until very late Renaissance days, (and then, by the way, it was the influence of the newly discovered free statues of antiquity which turned them away from the models they had earlier found in Roman sarcophagi). Through the Classic influence they learned to use the relief in an infinitely more artistic way than any northern school; learned to recognize the demands of its fields and to fit thereto their most multitudinous groups; and learned to master all its different levels from the highest to the very lowest. Yet nevertheless all the great men of the fourteenth century seem *chiefly* Christian and naturalistic in their aims — Andrea and the lesser so-called Pisani, Orcagna, Arnolfo del Cambio — greater as an architect than as a sculptor — Giotto and the rest.[1] The last name is the most important, not as being that of the greatest sculptor who followed Giovanni, Andrea Pisano claims this place, but as being that of him by whom the now vital art passed over from the chisel to the brush.

With the incoming of the fifteenth century we note a change. The Gothic sculptors had studied their subject, humanity, from many sides; for sculptural beauty somewhat, for physical truth still more, but most of all for spiritual force. The early Renaissance sculptors persisted in all three of these efforts, but gave a more prominent place than before to sculptural beauty, a lesser place than before to spiritual force, and the most important place of all to physical truth. They are not only naturalistic but *realistic* in their aims. A portrait-like rendering of the individual body seems to have attracted them beyond all else. Among the great fifteenth century names, Della Quercia, Donatello, Luca Della Robbia, Verrochio, Mina da Fiesole, Desiderio, Matteo Civitali, Benedetto da Majano (the list is endless), Donatello's stands out as the most characteristic, the most typical; and Donatello was the greatest "realist" of all. But Italian art was so well-balanced and harmoniously-rounded a development that we must not push too far the significance of defining epithets. It is easy and it is in a way correct to say, for instance, that Donatello is a realist and, by comparison, Ghiberti an imaginative idealist. But in such a decision, we really note not radical contrasts implying narrow, strictly-marked limitations, but delicate contrasts implying a slight preponderance of one quality over others which are just as truly present. It is better to say that each and all of the great fifteenth century artists are many-sided, that each and every one resumes within himself, in spite of his leaning a little to the one side or the other, what all resume together — the entire three-streamed tendency of the time toward a perfect art combining beauty, truth, and spiritual feeling. If Donatello were absent who would but call Ghiberti a great realist? and if one looked only at such among Donatello's works as the "St. Cecilia," for example, or the "Triumph of Bacchus" in Florence, or the bronze *patera* in the South Kensington Museum, who but would call him a true disciple of antique art, a true Classicist in his love for pure sculptural beauty? And is not the Classic influence very visible in the character of even his utmost realism, in the *choice* he makes between what subjects he shall take for realistic rendering, in the rarity — perhaps it is not entire absence — of examples where ugly types have tempted eye and chisel? And the same good taste shows through all the realistic work of Italy, save, of course, when definite portraiture has been required. And even here, even when the ugliest of sitters has been rendered with a fidelity and truth unsurpassed, nay, unapproached, in any age whatever, even here a certain subtile charm has been diffused which makes the result to be beautiful as art.[2] Thoroughly, inimitably realistic as was the portrait-sculpture of Italy it was never crudely, bluntly, baldly realistic as was so much Gothic art, as is so much modern art to which the same adjective is applied. And for this virtue it was indebted to the uninterrupted persistance of the Classic influence.

Yet, to return to our two great masters, it is nevertheless true that when the work of each is considered as a whole, realism predominates in that of Donatello, the love of beauty in that of Ghiberti. Luca Della Robbia was not so great a man as either — not so powerful, not so versatile, not nearly so imaginative or profound, and, coming after them, he had learned from each that which each had developed for himself. And yet, as I wrote before, he stands very high and his station is unique. It is unique just because with him we cannot say which tendency predominates, whether the love of individual truth or the love of beauty, just because when taken as a whole his work seems perfectly balanced between the two extremes; and there is even more to be said of him than this. These two great aims, great tendencies, had not yet extinguished the third that I have named. There was still something more desired in the way of artistic expression than the expression of beauty or of personal idiosyncrasies; the artist still desired to render a great general sentiment, and this sentiment still meant Christian feeling. But the desire was gradually fading. It is not very conspicuous even with Ghiberti or Donatello; with Luca, however, it is conspicuous, so conspicuous that we must rank it with his love of beauty and his love of physical truth, and say again that it is impossible to decide which is the strongest in his perfectly balanced art. Not only now and then like Donatello, not only here and there and chiefly in his earlier work, like Ghiberti, but always and everywhere, Luca is a distinctly, typically Christian sculptor. He is as Christian in his feeling as the fourteenth-century Gothicists, though he expresses that feeling in a very different way. It is not only that his technical resources are perfect while theirs are imperfect, it is not only that he cares so much more than they for beauty and for physical accuracy; his main ideal is quite different from theirs. He does not desire as they to tell stories, to point morals, to be dramatic and emotional, mystical and supersensual; he wishes simply to put the pure sentiment of Christianity, of faith and hope and gentle charity into all his work. He does it perfectly, and yet that work is almost Greek in its beauty of form, almost Donatellesque in its strict veracity. It seems to me that there is no Italian artist who equals him in this perfect combination of many qualities. One or two sculptors came after him who at times were exquisitely Christian, too, and possessed their art with equal mastery of hand. But there is much in the fact that they did come after him, and we cannot help seeing, too, that they lack something of his beautiful simplicity, his utter freedom from affectation, pose, self-consciousness. Compare, for instance, Matteo Civitali's well-known figure of "Faith" with one of Luca's figures, I care not which. You will feel, I am sure, the difference I have marked. And the very name I cite points out a change — a change in ideals and aims as great as that other which separates Luca from the dramatic, mystical Gothic age. His art is as frank, as real, as it is simple. He gives us madonnas and saints and angels that are realized as distinct human individualities; but the later art gives us typified abstractions, impersonal allegoric idealizations, which soon turn into half-pagan nullities, as meaningless to the spectator as artificial to their creators.

Nor do I think that there was any one in painting who is exactly what Luca is in sculpture. The development of the sister art was so much slower that when the brush had become perfectly skilful and free, as was Luca's chisel, Christian feeling had all but disappeared, or preserved a merely official and unvital life. A comparison of dates is interesting and instructive. Ghiberti and Donatello were twenty years older than Luca, yet their art had reached technical perfection. But Luca's own contemporaries of the brush were Paolo Ucello, Masaccio, Squarcione, and Giacomo, the eldest of the Bellinis. Filippo Lippi was twelve, Benozzo Gozzoli was twenty, Giovanni Bellini was twenty-six, and Mantegna was thirty years his junior. And fifty years later than he were still born painters whom we call "early" — Botticelli, Lorenzo di Cridi, Ghirlandjo, Signorelli, Francia, Carpaccio. Such dates tell strongly when we remember how quickly Christian feeling was fading before indifferentism or pagan sentiment. We may prefer these painters if we will to those who came in or after Raphael's generation. We may find a greater charm in the earlier work, and we cannot deny that even technically it is very noble; but it is certainly true that technically it is not perfect, had not that utter freedom in the use of its means which marks the apogee of a development. This freedom Ghiberti and Donatello and Luca did possess. If we consider the Renaissance movement as a whole, uniting all its branches, or if we consider it merely for its mood and temper, they belong to its earlier portion. But their own art as such is not "early"; it is technically complete. Their generation is the great typical generation of Renaissance sculpture; for the Sansovini and their fellows are already beginning the decline, are far less spontaneous, far less individual, far less Italian. They are giving at last an overweening importance to the Classic influence, and I do not think that their technique can be called more perfect. And Michael Angelo is an abnormal, isolated giant, typical of nothing whatever but himself. Luca's generation is the typical generation of Italian sculpture, Raphael's and Titian's are of Italian painting, and therefore it is not strange if in painting we find no such pure and powerful Christian sentiment as Luca's, expressed by a hand so entirely skilled as his.

M. G. van Rensselaer.

[1] This realistic tendency shows not alone in figure sculpture, but in all the ornament of early Renaissance architecture.

[2] For a charming and most suggestive criticism on the *technique* of Italian sculptors, I may point my readers to an article by Mr. Kenyon Cox in the *Century Magazine* for November, 1884.

A New Feature in Train-Despatching. — A French inventor has perfected an apparatus which enables railway despatchers — men who control by telegraph the movements of trains on the several divisions of the road — to see in a mirror the entire section under their charge. The apparatus consists of a sheet of opaque glass, on which the rails are indicated by horizontal lines and the stations by vertical ones, numbered. Little arrows, representing the trains, move along the horizontal lines. They are put in motion by aid of electricity, developed by the contact of metallic brushes attached to the locomotives with zinc bands placed along the rails. The train thus continually traces its trajectory on the glass indicator. The apparatus was exhibited a few weeks ago in Germany to a commission of Berlin scientists. While ingenious, it is said to be of not so much practical value as would at first appear. By the system now in use despatchers, knowing their divisions thoroughly, as they invariably do, can see the trains mentally as well as though they were shown in a mirror before them. —*Philadelphia Press.*

TEMPERED GLASS.



St WILFRID'S n York

UNDER this title Mr. Frederick Siemens brought before the Applied Chemistry and Physics Section of the Society of Arts, on the 26th ult., one of his first applications of his radiation furnace described on page 576 of the last volume of *Engineering*. It will be remembered that in Mr. Siemens's account of his furnace stress was laid upon the fact that flame soils what it touches, and that therefore all materials requiring to be heated should be under the influence of radiant heat only, and in applying his system to glass furnaces, Mr. Siemens claims that if the bed of the furnace is always kept in good condition, either by the use of clay or sandstone, or tiles dusted over with talc powder, the surface of the glass will not be soiled, whilst the whole mass will be uniformly heated.

As regards cooling glass, the following principle is laid down by Mr. Siemens: "The cooling must be so regulated that at every instant of time the temperature of the article shall be uniform throughout." Under these circumstances there will be no internal tension or strain whatever, and there will consequently be no tendency to crack or break. Another way in which this principle may be stated is that the cooling shall take place not in proportion to the surface, but to the volume or specific heat of the glass. In carrying out this principle, three processes have been devised, known respectively as press-hardening, semi-hardening, and hard-casting.

Press-hardening is principally employed for articles made of sheet or plate glass, which may be either flat or bent into a variety of forms, the glass being either plain, decorated or enamelled. The glass is first cut in the ordinary way to the proposed shape and size, and is then heated until quite soft; as soon as it has attained the requisite temperature, it is placed in a press between cold metal plates, and cooled down with a rapidity which can be varied according to the degree of hardness that it is desired to give to the manufactured article. If the glass is to be very hard, the temperature is raised to a very high degree, and the glass is cooled very rapidly by the use of copper plates in the press. If a less degree of hardness is desired, the glass is raised to less intense temperature, and iron plates are used for conducting away the heat. Still lower degrees of hardness can be guaranteed by covering the plates with asbestos paper, or using clay slabs in the presses. Glass may be thus rendered so hard that the diamond will not touch it, and it cannot therefore be cut or bent after manufacture; it may, however, be polished, etched, and slightly ground; its strength is about eight times that of ordinary glass.

The temperature to which the glass has to be heated is far in excess of that of an ordinary annealing kiln, and it is owing to the high temperature employed that the glass can be bent and shaped, and also decorated and enamelled, during the process of hardening. In ordinary enamelling, the temperature not being very high, easily fusible enamels, such as borax, are alone available, whereas in this case the high temperature allows of the use of refractory enamels such as are employed for porcelain. While ordinary enamel can be scratched off the glass, and does not resist the action of acids or even of the atmosphere, the enamel on hardened glass is as indestructible as the glass itself.

Articles made of semi-hardened glass are of forms to which presses cannot easily be applied, such as bottles, and are heated up in the radiation furnace to a temperature below that at which the glass alters its shape. When sufficiently heated, the glass is at once placed within a casing of sheet-iron, arranged with internal projecting ribs, so that the glass article is maintained in position and touched only at a few points; sometimes the casing with glass inside is heated in the furnace. The cooling is effected by placing the casing with the glass article inside in the open air. The process, like that of press-hardening, is only applicable to glass of nearly uniform thickness throughout; the strength of semi-hardened is three times that of similar glass unhardened.

Hard-casting is the third process to be described, its special value being that the glass may have almost any variety of thickness and form, and its strength increased threefold. The glass is melted in a continuous glass-melting furnace and then run into moulds. The process so far resembles that carried on in an iron foundry, but differs from it in a special material having to be employed instead of sand, and in the mould with glass inside it being heated and cooled together. The material used for moulding has to be chosen so as to have as nearly as possible the same conductivity and specific heat as glass. A variety of materials can be employed, these being pulverized and mixed in certain proportions, such as broken porcelain and glass-pots, metal filings and turnings, and such minerals as heavy spar and magnetic iron ore. The glass and the mould forming as it were one homogeneous body, the glass will cool without cracking, even if the cooling process is comparatively quick, which is quite necessary if hard glass is to be produced.

Some experiments were made at the meeting on the comparative strength of hard and ordinary glass, and there were exhibits of glass made by each of the three processes. Of the press-hardened glass there were some plates similar to those used for fitting up the chart-room on board H. M. S. *Inflexible*, which were ordered after a report of trials made on board H. M. S. *Gratton*, where the hardened glass withstood the concussion of the firing of heavy guns. There were also shown some military bottles made of semi-hardened glass, of which ten thousand have already been supplied, mainly to volunteer regiments in this country. Other exhibits included several samples of hard-cast glass, tramway rails and sleepers, floor-plates, grindstones, and a tuning-fork, each of the prongs of which had a sectional area of four square inches, and was fifteen inches in length. The clearness of the sound when this glass was struck was one of the best proofs of the homogeneous nature of the material of which it is formed.

Mr. Siemens reported that during the last eight years the manufacture of press-hardened glass, mainly of such goods as sign-boards with enamelled inscriptions, figures, and other ornaments, had increased from £600 to £7,000 annual value, whilst there appears to be no indication of a diminution in the rate of increase. The third process described is the one which he thinks possesses the largest commercial value, as he can produce hard-cast glass at 5 *s.* 6 *d.* per hundredweight, and is of opinion that at that price it will take the place of stone and porcelain, and even iron, for a number of applications. As yet it is only in the experimental stage. Mr. Siemens is now building works which will be completed in a couple of months, when he proposes to bring the matter again before the British public, and, if one reads his remarks aright, with the wish to establish works in this country. There will doubtless be little difficulty in carrying out his wishes in this respect, if he can prove, after a commercial test, that the value of his glass is such as his experimental trials have led him to believe. — *Engineering.*

PHOTOGRAPHY IN THE PRINTING-PRESS.[1] — I.



THE application of photography to the printing-press is now so nearly universal that I feel I may occupy your time this evening in describing processes which must be more or less technical and wearisome. I believe, however, I am warranted in saying that not a single book or picture, not a single illustrated paper or magazine, not a single catalogue or illustrated announcement is to-day produced without its aid, either directly or indirectly. In the course of what I have to say, I shall endeavor to indicate and explain the various methods of its applications to these purposes.

In the first place it will be well, in the fewest words, to sketch in outline the ordinary photographic method, as a proper starting-point. What we call a photograph is a picture produced by the action of light on certain of the salts of silver. If we brush the surface of a sheet of paper with a solution of nitrate of silver, it will blacken by exposure to light. This is photography, or writing by light, in its crudest form. By the use of suitable devices, this action is hastened, retarded, arrested. Before any practical use could be made of photography, this action of light was hastened, and a process was devised to develop an invisible image produced by the action of light on a film of silver. The results thus produced were named daguerreotypes, after their discoverer, Daguerre. We all know the beautiful pictures of this method, which, in some respects, have never been approached by later processes. But the pictures were all positives; that is to say, though a completed picture was obtained, there was only one of a kind, and if another was desired, you had to again photograph from the original object or sitter. Talbot made the next step by producing a negative, a picture which was not complete in itself, which involved another operation, printing, to produce the completed positive; but with this great advantage, that this second operation could be repeated as many times as you wished, without

[1] A lecture recently delivered before the Boston Young Men's Christian Union by Mr. Ernest Edwards.

going back to the original object or sitter. Paper was Talbot's vehicle for making negatives, but it was soon superseded by collodion. Collodion was introduced by an Englishman, Archer, in 1851, I think, and from its introduction up to within the last few years, collodion has held undisputed sway for the purpose of making negatives. Gelatine is now in the field as its opponent, and surely and rapidly is taking its place. Before many years, I predict that collodion photography will be one of the "lost arts."

Photography then, you see, speedily divided itself into two processes: first, making the matrix or negative from the object, and then printing the picture from the negative. Making the matrix or the negative is a necessary part and parcel, and the first step of all printing processes, past, present and to come; and practically a negative is the same for every process. The difference comes in the printing method. The pictures which to-day we call photographs, but which more properly ought to be called silver photographs, are produced by that darkening of the salts of silver under the action of light, of which we have spoken. This was the first process used; it became at once immensely popular, it has retained its popularity to this day, and is likely to continue to retain it. With the perfection that has been reached, it would be difficult, and indeed impossible to surpass the beautiful photographs that surround us in all directions. But silver photographs have serious objections; foremost of all, they fade. No matter what precautions we take to prolong their existence, no matter how carefully they are treated, sooner or later they will fade, just as surely as silver will tarnish. The carbon process, in which carbon or the pigments used in the arts are made, by a series of ingenious devices, to form the picture, was worked out to meet this difficulty. So far, and perhaps on account of increased difficulty of manipulation, the carbon process has not superseded silver printing, but in skilled hands the results are, I think, artistically superior. So far as I am aware, the carbon prints produced by Messrs. Allen & Rowell of this city are not excelled by any in the world. The platinotype is another process devised to remove the stigma of instability attaching to silver photographs. In this the salts of platinum — a metal which does not tarnish like silver — were substituted for the silver salts. This method, though used to a limited extent in certain directions, is not likely to become popular.

But though the carbon process, which, by the way, is best known under the name of autotype, removed one objection to silver photographs, there were other and more serious objections, to remove which have kept an army of experimenters and workers busy for the last twenty years. Besides the want of permanence, there was a continuous call for something that could be produced more quickly and cheaply, as well as something more permanent. The beauty and fidelity of the results produced by the youngest born sister of the arts could not be gainsayed, but their usefulness could be but limited till they took such shape that they could emanate from that greatest educator of all, the printing-press. In some shape or other that must be achieved, or the new art-science must stand still. It is my purpose to-night to show the success that has been achieved in this direction, and by what methods it has been reached.

I will remind you of my remark that "making the negative or matrix is a necessary part and parcel, and is the first step of all printing processes, past, present and to come, and that it is practically the same for every process." The experimentalists in the work of applying photography to the printing-press had, therefore, their first step taken. They started with the photographic negative. Two courses were now open to them: either they must devise new methods of printing, with new appliances, to suit the necessities of the new art, or the older printing methods must be employed and the new photographic elements be adapted to them. Both courses have been pursued, and two such groups of processes have resulted. In one group we have processes having their own methods of printing, such as woodburytype, albertype, heliotype, artotype, etc.; in another group we have photography applied to the various printing methods of lithography, typography, plate-printing, resulting in photo-lithography, photo-engraving, photo-gravure. Before describing, in detail, these two different groups of processes, we may explain one more step which is common to all of them. Besides the use of the photographic negative, and before their roads separate, all of them rely in common on the action of light on bichromatized gelatine. The action of light on silver under certain conditions is to blacken it, and make a silver photograph. The action of light on gelatine under certain conditions is to make it insoluble in water. Gelatine, in its ordinary condition, can be readily dissolved in water, but if we add to a watery solution of gelatine a portion of bichromate of potash, then dry and expose it to light, the light has produced an action on it, which makes it no longer soluble in water. So that when a negative is interposed between a sensitive sheet of gelatine and the light, and in this way certain portions are shielded from the light, those portions remain unaffected and in their normal condition, whilst where light has acted through the negative the gelatine is rendered insoluble. This action of light on bichromated gelatine under a negative, so as to obtain an insoluble image, is the second step, the use of the photographic negative being the first, which is common to all the processes in which photography is applied to the printing-press. At this point comes the division into the two groups, one consisting of woodburytype, heliotype, albertype, etc.; and the other including photo-lithography, photo-engraving and photo-gravure.

Taking the latter group first, photo-lithography properly takes precedence, as it is the oldest practical method of applying photography to the printing-press. Lithography, or the art of printing from stone, is based on the mutual repulsion of grease and water, and, as is well known, its discovery was accidental. An image is drawn on a peculiar kind of porous stone, with grease; the porous stone is sponged with water, which is absorbed where there is no grease. A greasy printing-ink is then rolled over the stone, which only attaches itself where there is grease, that is to say, to the greasy image. A portion of this greasy ink is transferred to paper by pressure, and we have a lithograph. The operation is repeated, either in a steam or hand press, as often as may be desired.

If now, first a photographic negative is taken, and next it is printed on bichromatized gelatine, the latter will become something like the counterpart of a lithographic stone. Parts of the gelatine, where the light has acted through the transparent parts of the negative, will be rendered insoluble in water; whilst those parts where the negative is opaque will have been shielded from the action of light and will continue soluble. But anything insoluble in water will not absorb water, and so is water-proof. Being water-proof, ceasing to have any affinity for water, grease readily attaches itself. On the other hand, the soluble parts have the reverse action: they absorb water and therefore refuse grease. So a greasy ink image may be formed on a surface of bichromatized gelatine in the same way as on a lithographic stone, but with this important difference: it has been produced entirely by photography instead of by hand. It is, of course, readily transferred on to stone from the gelatine, when the treatment of it is in all respects the same as if it had been drawn on stone. There is, however, one serious limitation to photo-lithography. A lithographic stone will either absorb water and refuse grease, or it will take grease and refuse water; there is no half-way, as in a photograph. A lithograph always consists of black (or some other colored) ink on a white (or some other colored) ground. Therefore, any subject to be photo-lithographed must have the same characteristics; and in order, also, to meet the requirements of photography, the subject must be in black lines or dots on a white ground. Where the subject to be reproduced has not these characteristics, either it must be redrawn specially for the purpose, or some of the other processes must be adopted.

The photo-lithographic process consists, then, in first making a negative from an original, in black on white, printing this negative on the surface of paper coated with bichromatized gelatine, producing a greasy ink image on the parts of the gelatine acted on by light, and transferring this greasy ink image to stone, which is subsequently treated by the ordinary lithographic methods. The applications of photo-lithography are very numerous and important. The whole of the illustrated portions of the *Official Gazette* of the Patent Office, including the types as well as the drawings of the patents themselves, are printed by this method, which is now being adopted for a similar purpose by the English Patent Office. It is largely used for illustrations in almost all departments in Washington, and it is the means of producing the illustrations in the New York *Graphic*, as well as in many class-journals, such as the *American Architect*, and it is probable that a majority of the maps and plans now in use are produced by its means. The process is economical, and in the case of large contracts exceedingly so. Some idea may be formed of its cost from the contract price at which the illustrated pages of the Patent Office *Gazette* are now being supplied. This price is at the rate of $6.37 for six thousand copies of a page, eight by eleven inches, including paper.

If, instead of transferring the greasy image obtained on bichromatized gelatine for photo-lithographic purposes to stone, it is transferred to zinc, we have on zinc a design which can be treated so as to resist the action of acid, which, however, will eat or etch away those portions of the surface of the zinc not protected by the design, leaving the design itself in relief, like a type. This enables us to print from it as if it were a type, that is, along with type, in an ordinary typographic printing-press. We thus have a process of photo-engraving, where a type-printing plate is obtained, first by obtaining a negative; from this negative an image in printing-ink on bichromatized gelatine; this image is then transferred to zinc, and the zinc surrounding the image etched away, leaving the image itself in relief. But bichromatized gelatine is used as well in another way, as a means of making photo-engraved plates. Gelatine in its normal condition is like sponge; it absorbs water and swells in absorbing it. You will remember that the action of light on bichromatized gelatine is to make it insoluble or water-proof. If it is water-proof it is obvious it can no longer absorb water, and therefore can no longer swell. So that if bichromatized gelatine, after the action of light through the negatives on it, is placed in water, the hardened part, that is, the image, does not swell, whilst the surrounding parts, protected from light as they have been, absorb water and swell up. Thus we have the counterpart of the image in relief, and exactly the reverse of what we want for a plate capable of printing with type, for the image is sunk instead of being in relief. It is unnecessary to describe the method of doing so here, but it is easy to see that an electrotype or stereotype obtained from this swelled gelatine intaglio gives us what we want for type-printing. It is this latter method of photo-engraving which is so largely used in producing book illustrations as a substitute for wood-engraving. There are but few illustrated books which do not contain examples of it, and even in the highest class magazines, such as *Harper's* and the *Century*, it can frequently be detected. This country is essentially the home of this process, and many large establishments are devoted especially to the production of this work. In photo-engraving, as in photo-lithography, the original must be



PHOTO CAUSTIC, HELIOTYPE PRINTING CO. BOSTON.

St. Etienne du Mont, Paris, France.

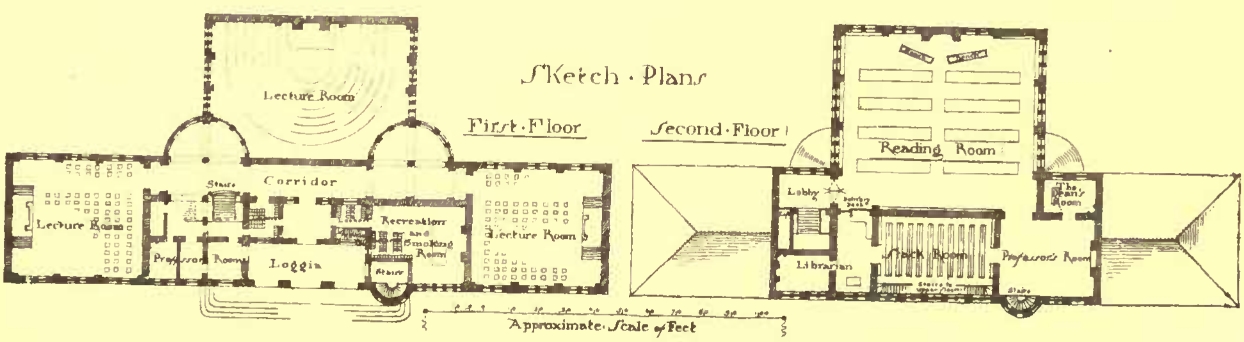
No. 483 AMERICAN ARCHITECT AND BUILDING NEWS. MAR. 28, 1885

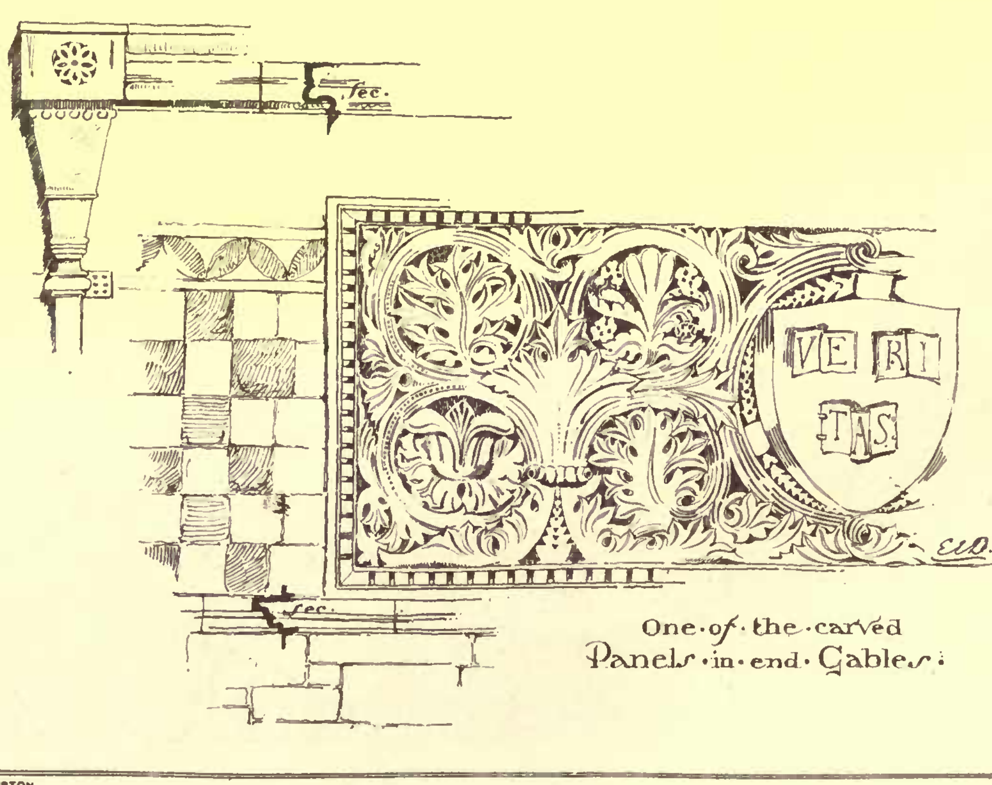
The · Law · School · Harvard · College · Cambridge · Mass ·

Mr. H. H. Richardson, Arch t.: Brookline:



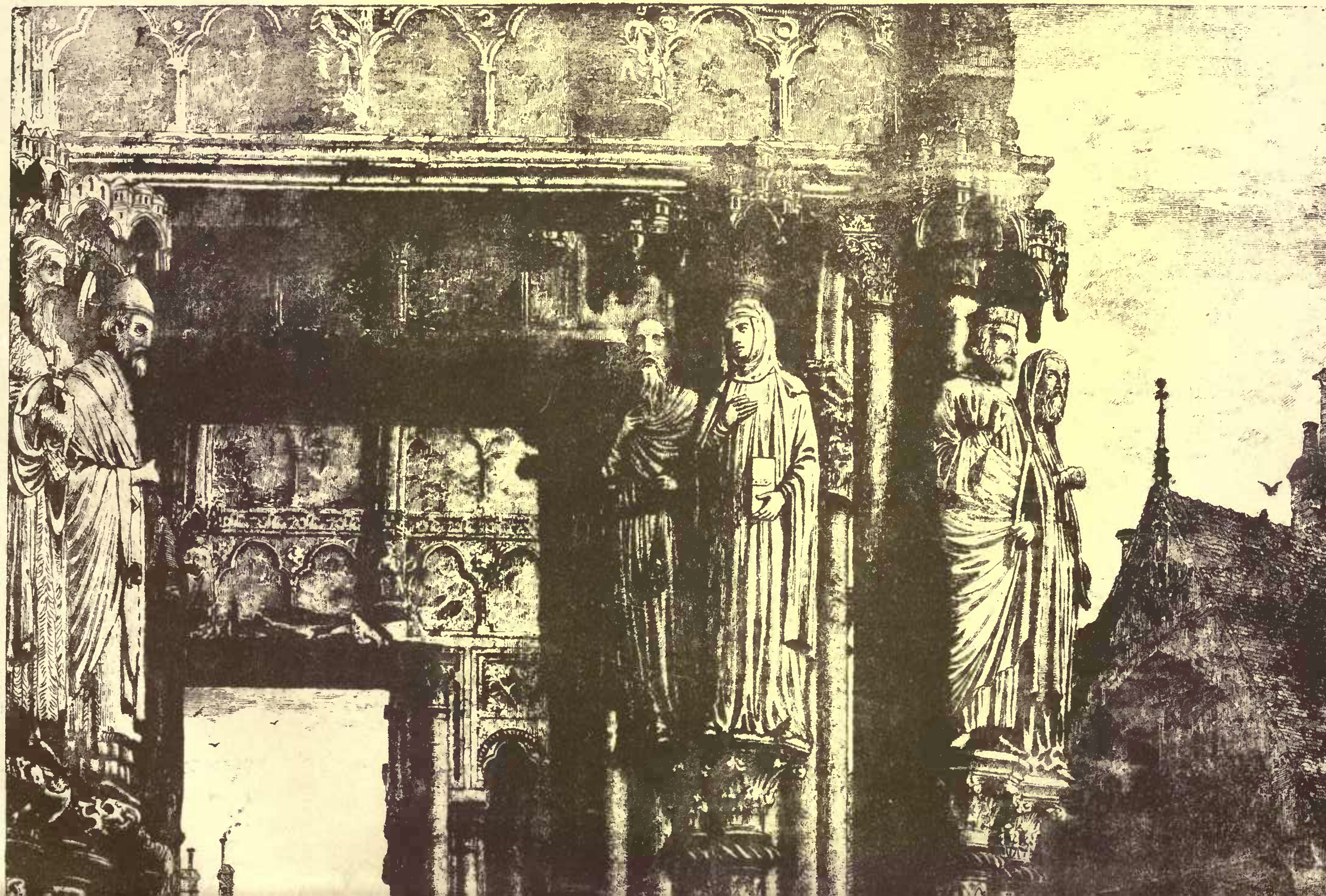
Fireplace · in · Reading · Room

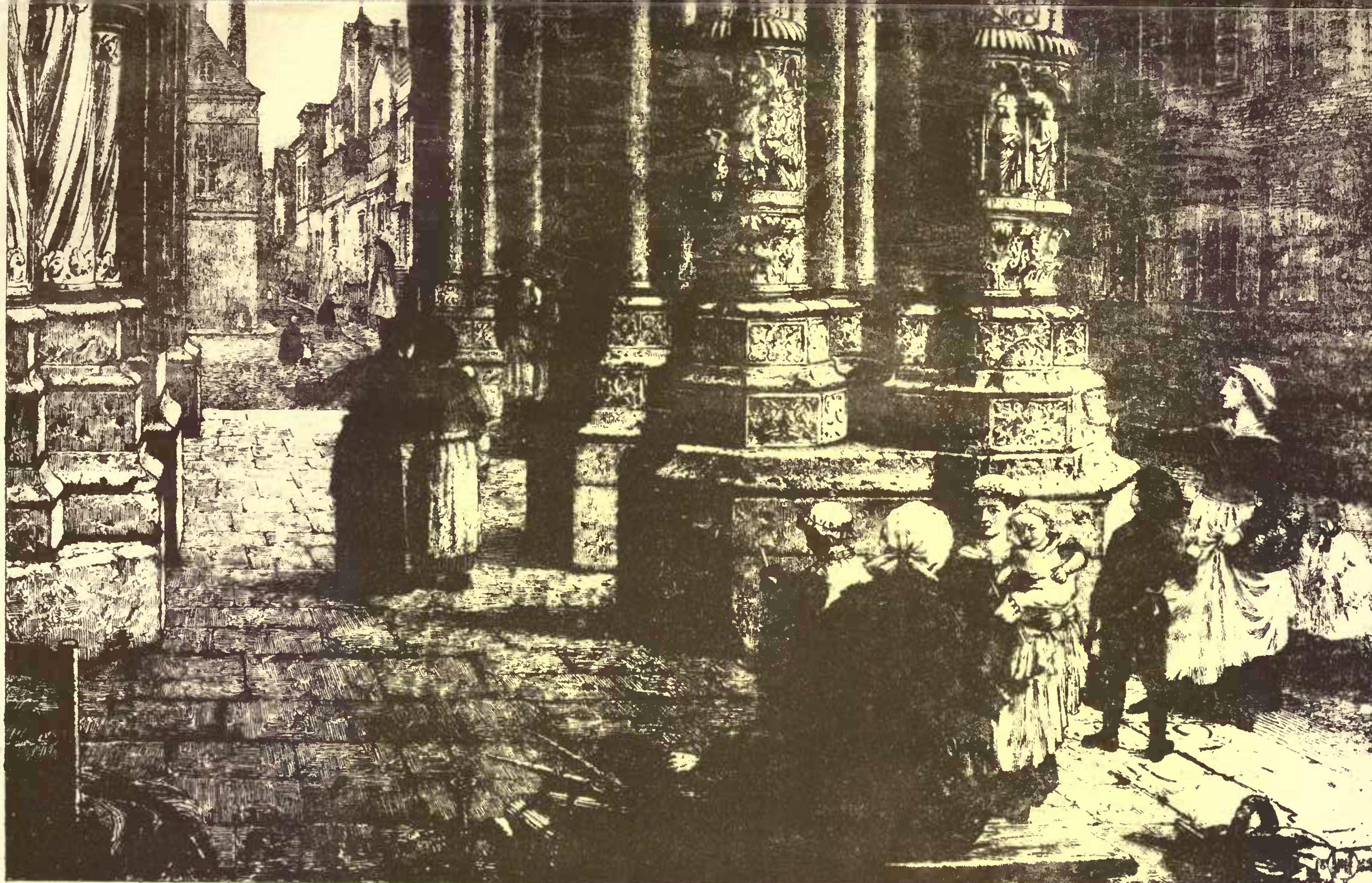




One · of · the · carved Panels · in · end · Gables ·

HELIOTYPE PRINTING CO., BOSTON.

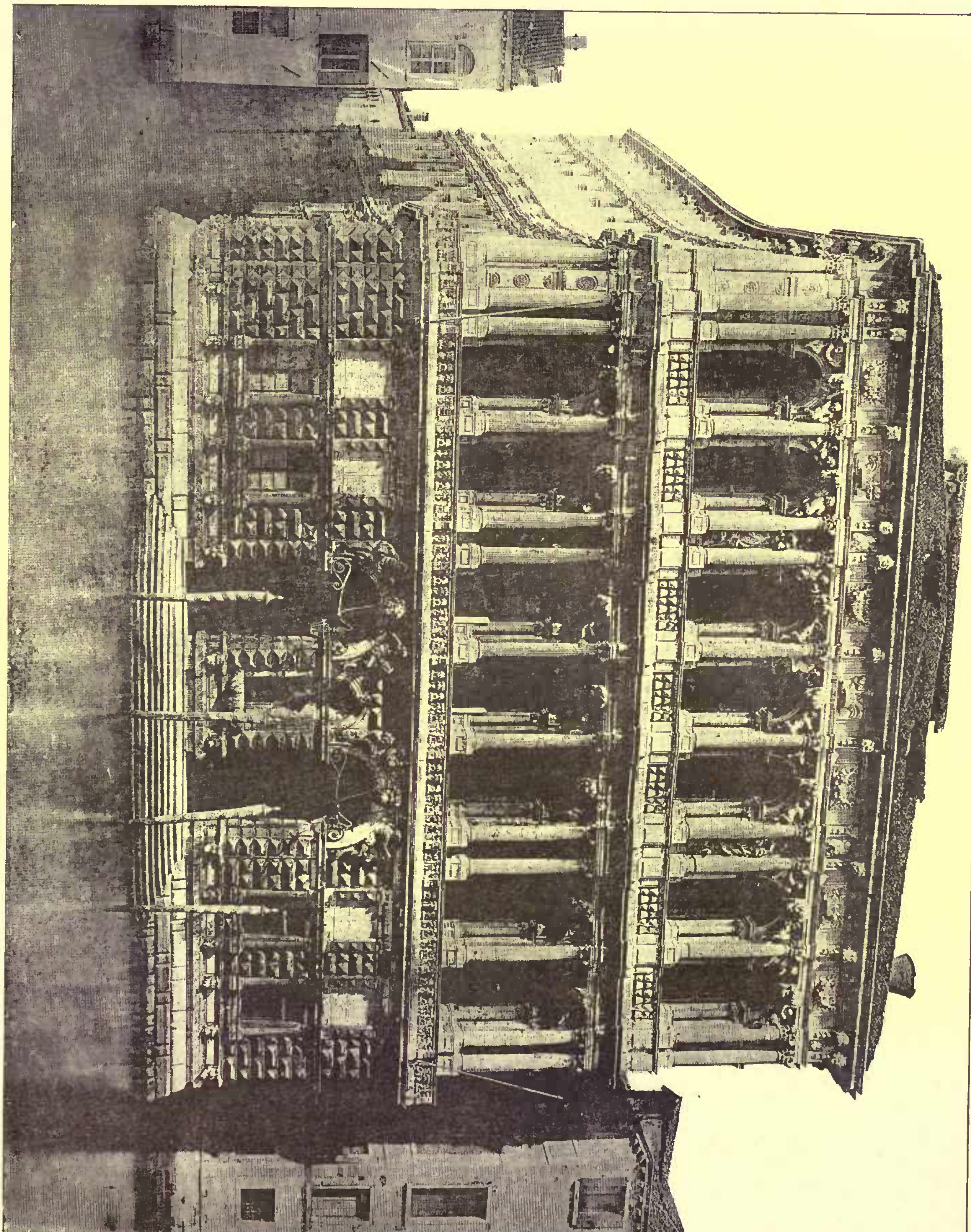




Axel H. Haig.

North Porch of Chatres Cathedral.

Etched by A. H. Haig.



PALAZZO PESARO, VENICE, ITALY.

PHOTO CAUSTIC. HELIOTYPE PRINTING CO. BOSTON

suitable for the purpose; that is, it must be in black lines or dots on a white ground.

Therefore a photograph, say a portrait, must be converted by drawing into black lines or dots, to be available for reproduction by photo-engraving. Great skill and considerable cost must be expended to produce this result, and after all, the charm of the photograph is almost inevitably lost.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

THE NORTH PORCH OF CHARTRES CATHEDRAL, AFTER AN ETCHING BY A. H. HAIG.

THE work of Mr. Haig is more purely architectural in feeling than that of any living etcher. Doubtless a prime reason for this lies in the fact that he studied architecture for a number of years. He furnished pen-and-ink drawings for reproduction by photo-lithography in the London architectural journals, and the writer recalls seeing at the Royal Academy in 1880 a fine colored drawing by him of a library at Kensington after a design by the late W. Burges. We find in Mr. Haig's etchings the qualities which such a training might naturally be expected to give: namely, accurate drawing and truthful effects obtained by the use of strong, well-understood lines. The thoroughly honest and able work of a man of talent, Mr. Haig's etching lacks, however, some of the higher qualities of the art. We miss the clear atmosphere of the brilliant Lalanne, the delicacy of Delauney, the bold light and shade and freedom in handling of Lhermitte, and the sense of color possessed by Jacquemart. It is, therefore, with some surprise we meet the fact that, on the whole, the etchings of Mr. Haig command a higher price to-day than those of any living man. His "Mont St. Michel," which is the largest plate he has etched (Haig usually produces work on a generous scale), and was published, we believe, at $60, has been sold for $250, and several of his other etchings have risen in value to two, three, or even four times their original price. This is, perhaps, partly accounted for by the fact that but a limited edition is printed (not over five hundred of any one, we understand), but still it is remarkable that prints of architectural subjects, which do not appeal strongly to the popular mind, should be so eagerly sought after. At all events, so it is, some of Haig's etchings being already "rare," and that within a few years only of their issue. Haig is decidedly the vogue, and time will tell whether the passion for his prints, like most fashions, will decline. To the writer of this it seems certain that it will, and the excellent work of this etcher find its proper place, — a high one, but not with the highest.

Mr. Haig, whose full name is Axel Herman Haig, was born in Ostergarn, Sweden, in 1835. He is mainly self-taught, having taken lessons in drawing as a lad at Wisby and then studied ship-building at Carlskrona and on the Clyde for several years. Thence he removed to London, where he has now resided for some years. He exhibits regularly at the Royal Academy, and won a third-class medal at the *Salon* of 1882. The names of his principal plates, in addition to those before mentioned, are "The Vesper Bell," "The Morning of the Festival," "The Quiet Hour," "The Pulpit of San Fermo Maggiore at Verona," "Peterborough Cathedral," "A Street in Seville," and "Seville Cathedral." He has also executed three other etchings illustrating the Cathedral of Chartres, one of which is an interior view, showing the aisles. Mr. Haig is said to be now engaged upon two plates of Westminster Abbey (an exterior and an interior view). The "North Porch of Chartres" is an admirable example of Haig's quality at its best.

Lowell's fine lines on Chartres porch will probably be new to many of our readers: —

"I stood before the triple northern port,
Where dedicated shapes of saints and kings,
Stern faces bleared with immemorial watch,
Looked down benignly grave and seemed to say, —
'*Ye come and go incessant; we remain
Safe in the hallowed quiets of the past;
Be reverent, ye who flit and are forgot,
Of faith so nobly realized as this.*'"

COMPETITIVE DESIGN FOR A BARN SUBMITTED BY "*Pen.*"

THE materials required for building the stable are supposed to be at a reasonably convenient distance from site. The stable is built on brick piers, run into the ground below frost line.

The size of timbers are: sills, 4″ x 10″; plates, posts and inter-ties, 4″ x 6″; intermediate studding, set sixteen inches from centres, 2″ x 4″; first and second tier beams, twelve inches from centres, 2″ x 10″; roof-rafters, 2″ x 6″; hip and valley rafters, 2″ x 8″; ridge rafters, 2″ x 8″.

Double studs at all door and window openings. The first story will be covered on the outside with six-inch elapboards, and the second story and roof will be shingled. The inside on first story is to be ceiled with four-inch tongued, grooved and beaded ceiling-boards. Man's room will be lathed and plastered.

Most people keeping two horses generally require an extra stall in ease of an emergency, therefore I have shown a box-stall.

Estimate of cost of building near Newark, N. J., as follows: —

Carpenter-work, including painting..................	$1,280.00
Mason-work..................	120.00
Architect's fee, at 5%..................	70.00
Total	$1,470.00

PALAZZO PESARO, VENICE.

THIS palace was built in the year 1679, by Baldassare Longhena, the architect of the church della Salute and of Palazzo Rezzonico, and it is the richest example of late Renaissance in Venice.

All that the wildest imagination of the seventeenth century could devise in contortion of figure and grotesqueness of human face and of bestial monster, is here displayed. Despite this grotesqueness of character, its detail has a value in itself quite extraordinary for the sculpture of this period. "The heads upon its foundation," says Mr. Ruskin, "have more genius in them than usual. Some of the mingled expressions of faces and grinning casques are very clever" ("*Stones of Venice*," III, 319), and the way in which the decoration is subdued to the severity of architectural purpose makes it the most powerful inspiration of a great artist, whose architecture was quite in harmony with the gorgeous pictures and poems of his time. Its grand masses of light and shade impress us from the first, and turning back we wonder at the solemn look which follows us as we float away, till, growing more and more tender, it becomes lost in the bluish mists of the distance. G. BONI.

AUSTIN HALL. — HARVARD COLLEGE LAW SCHOOL, CAMBRIDGE, MASS. MR. H. H. RICHARDSON, ARCHITECT, BROOKLINE, MASS.

[Gelatine Print, issued only with the Gelatine Edition.]

THIS building, erected by Mr. Edward Austin as a memorial to his brother Samuel, was finished last autumn after eighteen months' or so labor, and the expenditure of about $145,000. Built of Long-meadow stone from the Kibbe quarry, relieved with Ohio stone, the building does not look too new for its site, which is outside of the College Yard proper on one of the numerous little "greens" common in Cambridge. A few bits of bluestone in the spandrels of the entrance arches lend an astonishing amount of color to the main feature of the building — the entrance-porch.

FIREPLACE IN AUSTIN HALL, CAMBRIDGE, MASS. MR. H. H. RICHARDSON, ARCHITECT, BROOKLINE, MASS.

ST. ETIENNE DU MONT, PARIS, FRANCE.

ST. ETIENNE DU MONT, one of the most fascinating churches in the world, is situated in the Latin Quarter of Paris, and with its neighbors, the Panthéon and the Bibliothèque St. Geneviève, makes the most interesting group of buildings in Paris. One is never tired of admiring the way in which the Gothic feeling seems to pervade a Renaissance after-treatment that in most cases would be thought to be an architectural solecism. In some way the observer is led to feel the poetical perfection of the building without being allowed to criticise its parts. The choir-screen, reached by stone spiral stairs winding about the huge columns of the crossing, with other features, makes the interior no less fascinating than the exterior.

THE LATE LUDWIG BOHNSTEDT.

LUDWIG BOHNSTEDT, one of the most distinguished architects of Germany, died in January at Gotha, in his sixty-third year. He was the son of German parents settled at St. Petersburg, but studied in Berlin, perfecting himself in Italy. In 1851, when only twenty-nine years of age, he was appointed court architect at St. Petersburg, and seven years later Professor of Architecture in the Russian Academy of Fine Arts. While holding these positions, he built the Monastery of the Resurrection at St. Petersburg, and several splendid public buildings. In 1861 he migrated to Gotha, and soon gained a great reputation for the originality, completeness and beautiful details of his designs. In the first competition, in 1872, for the design for the Reichstag building to be erected in Berlin, he obtained the first prize. He also built the Cathedral of San Torquato, in Portugal.

THE *AMERICAN ARCHITECT* STABLE COMPETITION. — V.

THE JURY'S AWARD.



"*V. O. C.*" — Plan is fairly good, but with waste-room. Porch unnecessary, as is also the office; man's room of inconvenient shape. Entire *tourelle* treatment expensive and not particularly successful in design; seems detached from rest of building. Stalls should be separated from carriage-room in all stables that are to be used in the winter. General effect of building heavy; rendering hard and stiff.

"*Burns.*" — Plan good. Harness-room too large. Fireplace unnecessary. Exterior too high. Windows large. Roof over stable-room would not show in perspective. Rendering spotty. Details heavy.

"*Puck.*" — Stableman's room unnecessarily large and bay-window too much of a motive. Mass of main body of stable good. Ventilator too high. Rendering lacks clearness.

"*Asmodeus.*" — Plan a very bad one. No connection between

carriage-room and stable-room. Only way of getting to loft from stable-room is by going through harness-room and man's room; and water-closet, besides being unnecessary, should not open from harness-room. Stable covers altogether too much ground; could not by any possibility be built for $1,500. Exterior mass is picturesque, but somewhat too much cut up in man's-room corner. Details and rendering coarse.

"*The Square of the Circle.*" — Plan fairly good. Waste-room in stable-room. Elevation lacks balance. It would have been better to gable over end of carriage-room. Details very bad, especially the cresting and ventilator, twisted post and treatment over man's room gable. Rendering needs study.

"*Hope II.*" — Plan good. General mass good, except carrying the roof down over the porch. Ventilator unsuccessful. Details need refining. Rendering hard.

"*Immer vorwarts.*" — Plan good. Hostler's-room has very little head-room. Exterior mass simple. Balcony before hay-door would be much in the way. Details are coarse. General effect of building boxy. Rendering hard and stiff.

"*Jay Eye See.*" — Plan good. Mass lacks balance. It would have been better to use a gable instead of a dormer over carriage-room. Walls too high. Proportion of doors and windows too high. Rendering lacks shadow.

"*Rough on Rats.*" Plan good. Exterior projection, upon the upper part of a gambrel, for pigeons is not good. Hood over hay-door is not successful. Brick between studs about stable has practical advantages, but does not look well as shown. Rendering good.

"*Tom Pinch I.*" — Plan fairly good. Harness-room is inconvenient. As the exterior, the bay motive is especially unsuccessful, as it is roofed; it does not belong in character to the rest of the stable. Details are fairly good, especially the ventilator. Rendering good.

"*Vestigium nullum retorsum* [*sic*]." — Plan good. Exterior mass good. Eaves lack projection. Entrance-door should not cut up through belt. Ventilator boxy, with bad curve to roof. Rendering spotty.

"*Angular.*" — Brick first story is expensive. Plan is good. Carriage-room is shallow and with but slight room for carriages. Ventilator too large. Details of dormer good; of porch-posts poor. General mass good. Rendering needs study in free-hand work; is done too much with a T-square.

"*Polo.*" — Stable too large and outline of plan too much cut up. Kitchen, second staircase and apartment for hostler uncalled for. Entire front projection and gable waste-room. Exterior walls and roof too much cut up. Double ventilator unsuccessful. Truncated gable disagreeable — as it is in nine cases out of ten. Walls too high. Details good. Rendering labored.

"*Augean.*" — Harness-room inconvenient. Protecting frame outside of entrance-doors is neither necessary nor successful in design. Waste-room in feed and tool rooms. Man's room too large. Windows in man's room crowded too much up under gable. Ventilator too small and petty. Exterior mass good. Eaves should be stronger. Corbelling under man's-room bay not well drawn in perspective. Rendering good; a little scratchy.

"*Silence.*" — Carriage-room inconvenient in shape and size. Cow-stall should be separate. Feed-room unnecessary. Exterior roof cut up by windows in man's room. Hay-loft small. Break-in over manure-pit not agreeable. Details and rendering hard.

"*Try II.*" — Plan good. Corn-crib unnecessarily large; space had better be thrown into stable-room. Hostler's room too large. Exterior: the two different pitches of roof on sides and ends would be very disagreeable. The ventilator particularly would be anything but good in appearance. The cross-hatched shading in the rendering is bad.

"*Vie.*"—Plan good. Balcony a snow-trap and unnecessary. Scroll-work under the windows is not good; in fact none of the details are good. The louvres in roof of ventilator are unnecessary and bad. Walls are too high. Rendering hard.

"*Simplicity.*" — Should have stuck to his motto, cut up his walls and roof less, and left off all the peculiar and disagreeable treatment about the hay-door. The plan is good. Rendering scratchy.

"*Scotia.*" — Harness-room much too large. Mass of stable good. Panelling, with clapboards between, on gables is not good. Ventilator boxy. Rendering needs more free-hand work and less dependence on the T-square.

"*Student.*" — Plan good. Harness-room inconvenient. Too much space given up to hostlers in second story. Exterior mass simple. Ventilator would have been better if placed nearer the centre. Imitation open-timber work is not good. Rendering has the same vicious system of spotty groups of short lines that has been criticised before in one or two of the designs.

"*Convenience.*" — Much waste room in harness and feed rooms. Stable is simple and depends for its effect on its details, which are not sufficiently studied and refined to give it character. The flap dormer is not good, nor the head of the hay-door. Rendering is too much cross-hatched.

"*Midnight Worker.*" — Would only do for a summer stable. A winter stable needs to have the stall-room separated from the carriage-room. As a summer stable the plan is good, but with the man's room on the first floor, so much second floor is unnecessary. Exterior mass is simple and good. The windows are probably mill-sashes, and, in consequence, too high for their width. Details are simple. The eaves might be stronger and with more projection. The flat pitched roof on one side would have been better if kept the same pitch as the other roofs. Roofs of different pitches butting against each other are not agreeable. The rendering is careful.

"*Common Sense.*" — Plan is good. Truncated gables are not agreeable. Outside chimney does not look well. Details are hard and need study, especially at the ends of the verge-boards. General mass simple. Rendering mechanical.

"*Jockey.*" — Carriage-room of inconvenient shape. Harness-room should be near stable-room and is too large. Exterior mass is good, except ventilator, the roof of which is of particularly bad shape. Plastered pediment would have been better shingled. Rendering seems careless.

"*Utility.*" — Plan is good, but large. So much room for man is unnecessary. Long slope of stable-roof on rear would not be agreeable. Ventilator too high. Rendering labored.

"*Labor omnia vincet.*" — Plan good. Elevations and mass simple. Jig-sawed work in gable is not good, and the perspective of the ventilator is most peculiar. It would be next to impossible to get at the hay-chutes where shown on the second floor. The construction of the details and of the framing needs study. The arched head to main door is not good. The rendering looks young and untrained.

"*Jehu.*" — Stall-room should be separate from carriage-room in a winter stable. Harness-room too large. Exterior: truncated gable and window cutting through eaves disagreeable. Walls too high. Rendering scratchy; too much cross-hatching.

"*Perseverance.*" — Harness-room inconvenient and large. No man's room. Eaves should have been continuous. Stable-room windows too large. Details simple. Pediment over main door unnecessary. Rendering young and labored.

"*Equus sana* [*sic*]." —Plan is too large. Harness-room too large. Battened walls are not agreeable. Details need study. Rendering careful but labored.

"*Stability.*" — Plan good. In second story too much room devoted to man's quarters. General tendency of mass of building horizontal, and doors and windows perpendicular: as a consequence there is a disagreeable contrast. Rendering looks hurried and careless.

"*Draughtsman.*" — Harness-room is inconvenient. Coachman's room too large. Exterior is badly cut up, with all shapes and sizes of windows. Ventilator is too high. Rendering spotty.

"*Ingenuity is Genius in Trifles.*" — Plan good. Roof too much broken up. Treatment of gable verge-boards bad. Windows and doors too high for their width. Details too slight; lack mouldings. Rendering labored and too much cross-hatched.

"*Hard Times,*" "*Festina lente,*" "*Idle Hour.*"—All three of these designs have a marked perpendicular tendency. The pitches of roof and gables are too sharp, the windows and doors too high for their width, and the walls too high. This is less true of "*Idle Hour*" than of the other two.

"*Hard Times*" is *hors concours*, being received December 22. Plan is good. Harness-room too large. This design is weak in its detail, which resorts to jig-sawed work for effect, which is nearly always bad, unless done in thick pieces of hardwood, as in the Swiss chamfered and jig-sawed work. The front gable design is particularly bad. Rendering shows need of study in freehand drawing.

"*Festina lente.*" — Carriage-room small. Harness-room too large. Cow-stall should be separate. Battened work disagreeably cheap. Ventilator, set on plan at an angle, is bad; is too large and high. Eaves need moulding. Rendering careful and labored.

"*Idle Hour.*" — Plan good. Details simple. Eaves lack projection. Cresting should have been omitted. Rendering weak.

"*Cerberus.*" — Plan poor. Too much cut up for so small a stable, causing waste room in consequence. Two small carriage-rooms are not equal to one of double the superficial area in convenient space for carriages. This arrangement of rooms is symmetrical and architectural as far as it goes, but in this case has only succeeded in making the stable look like a chapel with nave, aisles and porch. Detail has been worked out elaborately, but is most commonplace and belongs to a type of work which fortunately is disappearing. Rendering is careful, but labored and too much cross-hatched.

"*Moss Rose.*" —A cow stall should not open from a carriage-room. The situation of the harness-room seems to have been selected for its remarkable inconvenience. With the doors placed as they are there is scarcely any available room for carriages in the carriage-room. The exterior mass is simple. The ventilator is not well shaped. The chimney would have been better left plain and carried inside. The arched head to the main door is not good. The windows are too high for their width. The rendering is painfully careful and worked over; lacks skill and power of rendering.

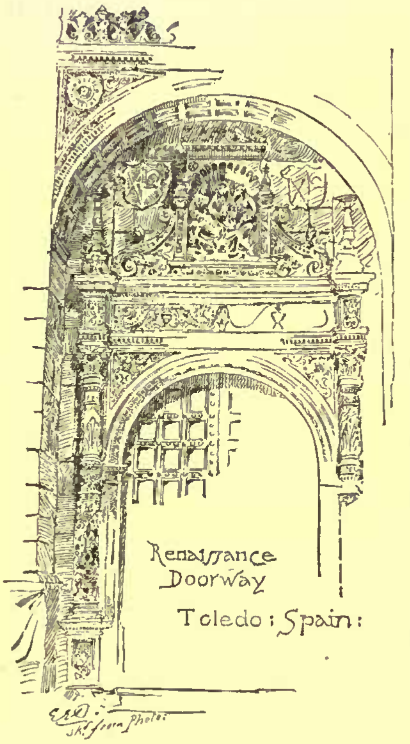
"*Novus Homo.*" — Plan is expensive. The man's room could have been in second story. It is always cheaper to build up from the ground than to spread out on it. Fireplaces are luxurious. The roof, especially in the rake mouldings, is badly cut up. The two-storied ventilator is not good in design. The rendering is painful in its fineness; it wants a sort of masculine virility that will make a good strong line or shadow somewhere, even if it isn't done in just the right place. Detail is poor.

"*Roberta*" is undoubtedly the poorest design sent in. "*Roberta*" has started from the outside and worked in, instead of starting with a good plan and working out, a fatal lack of a knowledge of the key-note to all good architecture. He has selected a design that strongly resembles a sketch in the *Croquis d'Architecture*, for a casino or

something of the sort, and tried to make it into a stable, not considering that a tower has nothing whatever to do with a small, cheap stable, where every inch of ground and every foot of height must have its purpose for being. As a natural result, neither his plan nor his elevation holds its own beside his competitors who have worked out the problem rationally. The plan has a pseudo-Italian look totally out of keeping with our climate or requirements. The details are commonplace, and the rendering alone shows that "*Roberta*" has facility in using his pen. The rendering of the perspective is free and good.

For the Jury, C. H. WALKER.

COMPARATIVE EFFICIENCIES OF STEAM AND HYDRAULIC ELEVATORS.



A CORRESPONDENT in the February number of *Mechanics* writes: The term hydraulic elevators is applied to elevators in which the actual motive power is furnished by an hydraulic motor, while the hydraulic pressure necessary for the operation of the motor is furnished by the natural head of the water. Where the pressure in street mains is sufficient to operate the motor, an artificial head need not be used, but in situations where this is not the case, an artificial head, produced by pumping water to a reservoir situated some distance above the hydraulic engine, or by pumping water directly into a pressure tank, from whence it is admitted to the motor, must be taken advantage of. This form of elevator is rapidly coming into favor, due principally to the more ready adjustment of the system over the ordinary hoisting engine, and also due to the fact that it is claimed to be more economical in steam consumption than the "steam elevator."

In order to fully understand the problem of the comparative efficiencies, we must consider first the theoretical efficiency of the hydraulic elevator as compared with the steam elevator. This question can be readily disposed of, as we find that in practice the hydraulic elevator descends by its own weight, while the steam elevator uses steam coming down as well as when going up; we therefore would naturally expect the hydraulic to be more economical than the steam. This view is, however, somewhat modified by a consideration of the practical view of the case. We find that the efficiency of the hydraulic system is subject to the following efficiencies of its different members, viz.: the efficiency of the steam end of the pump, the efficiency of the water end of the pump, and also to the efficiency of the hydraulic cylinder. These apparent efficiencies are still further reduced by the "steam slip" of the pump, as I have called it, which is due to the fact that when the upper tank is full, or when the maximum pressure is attained in the pressure tank, the automatic throttle-valve, controlled either by a float in the upper or the lower tank, or by a pressure regulator, does not close absolutely tight, and consequently the pump continues its motion slowly. From a number of experiments made upon pumps running in this way, I have found that the efficiency of the pump-end under these conditions rarely equals ten per cent; or, in other words, the volume of water actually pumped is but ten per cent of the plunger displacement. This is due to the slow motion of the pump allowing the leaks, etc., to relieve the pressure gradually, thus never allowing the pressure to become great enough to lift the discharge-valve. Further than this, if steam cylinder drips are left open the loss due to these is considerably augmented. The pump is in operation almost continually, while the loss in the case of the steam elevator occurs only when the engine is making its periodical motions. The fact that frequently an elevator capable of hoisting ten or twelve persons is called upon to carry but half that number, or even less, in a trip, detracts seriously from the efficiency of an elevator, the hydraulic elevator being affected more seriously than that worked by steam, because the amount of water used per trip is constant, no matter what the load may be, thus merely increasing the speed of the elevator and not effecting a saving. In the steam engine the amount of steam is proportioned by the governor, which in turn is regulated by the speed of the elevator. The steam elevator, in its turn, is subject to the serious loss by initial condensation of the steam entering a cold cylinder, and also to the heavy loss of power consumed to operate the gearing. The efficiencies of both the hydraulic and steam systems are further reduced by the fact that the steam end of the pump in one case, the cylinder capacity in the other, is entirely too great for the work, a fact which every engineer will instantly see produces a serious loss. This is purposely done by the elevator builders, to allow for the variable steam pressure so common in our buildings. I am strongly inclined to the opinion that an hydraulic elevator system may be rendered as economical as a steam system, and trust that the ideas here thrown out may help to lead to an improvement much needed in this direction.

COMPETITIONS.

ITHACA, NEW YORK, March 17, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,— Is it not worth while to point out the fallacy of "the key to the matter" which "W," with more zeal, perhaps, than discretion, has announced? He says "the key to the matter is that architecture concerns matters of taste, and matters of taste, rightly or wrongly, concern every one, the public quite as much as the architects." Which is of course true; but is it equally true (as "W" would have us infer) that "every one" is an *equally competent judge* in matters of "taste?" Quite as fallacious is "W's" comparison between architects and tailors, but for the sake of argument I will accept it, and suggest to him, as a practical test of its value, that he betake himself to some "well-known" tailor, and explaining to him certain original and radical ideas of his own, as to the cut and color of, we will say, a frock-coat, request him to make the garment. He will find that the tailor, if sufficiently "well known" will decline the honor, on the plea that he has a "well-known" reputation for taste and good judgment to sustain. Does "W" imagine that Worth defers in all respects to his fair clients' wishes, or at all, if they savor of bad "taste?"

I am equally inclined to doubt the soundness of "W's" conclusions with respect to the supposed legal competition. In the first place I feel sure that such competitions never take place, for the very good reason that the questions involved are recognized as being of too great importance to admit of any such loose method of solution. But even supposing the competition, does "W" think the client would take the responsibility of judging as to which might be the best solution offered; or, if not, would he not take legal advice in the matter, of a degree of skill and experience commensurate with the interests at stake? And if the legal adviser were competent to decide as to the relative merits of the various plans submitted in competition, would he not, either alone or in consultation with one or two other legal luminaries (experts in the questions involved) be equally competent to originate a satisfactory solution? And is not that, in fact, exactly what is done every day in the year, and solely for the reasons suggested?

The truth is, there are two kinds of competitions: honorable and dishonorable. In the first the professional advice offered will be paid for at its full value; in the second, the least possible return will be given, and in many cases the services of the competing "architects" will be *stolen*, under one plea or another. Of the first kind, the competition for the Cincinnati Chamber of Commerce is a recent and honorable example. The architects invited to take part in it will be well compensated, and I imagine the only reason why it has been instituted at all is that it is not as yet the custom for architects to be called together in consultation in important cases in the more normal way in which lawyers and physicians are. And, finally, permit me to say that while any effort to end the present disgraceful state of affairs in the matter of competitions is to be commended, I cannot but doubt the efficacy of the plan you are now so tardily fostering, for it seems to me to be at best but an artificial sort of protection. My own judgment in the matter is (though here not altogether clear) that the true solution may be reached when the architectural profession is raised from the position it now occupies to a level with the legal and medical professions, and that by distinct and *required* qualifications for practice, so that the *public* may be led to see the difference, of which we ourselves are fully cognizant (and to our sorrow) between a "well-known" and a "so-called" architect. CLEF.

BRIDGEPORT, CONN., March 18, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — We are continually in receipt of advertisements, invitations, etc., from all over the country respecting competitions, and we mail you a batch to-day, some of which are truly ridiculous; and it would seem to us that there cannot be any architects who are so low in the profession as to enter such competitions, the terms of some of which are really out of all reason; and as your journal is the representative of American architects and architecture we trust you will take hold of the matter with a view to protecting the same against the tricks so apparent in the wording of competition programmes now so extensively gotten up.

There must be a good reason for so much competition throughout the West, and we believe it is in a great measure brought on by the architects themselves, who court such competitions by solicitation and offering to make sketches on the "no cure no pay" basis, a practice which is very much to be deplored anywhere, and we see enough of it every day right in this State by members of the A. I. A. which we must say does not help that body or association.

The competition called for by the Board of Trade of Omaha, Neb., should be taken hold of by the architects of reputation of that city, and the Board of Trade helped to make it a perfectly proper and satisfactory competition, which we see no reason for not accomplishing.

Trusting to hear from you on the subject, we remain, dear sirs,

Yours very truly, PALLISER, PALLISER & Co.

WASHINGTON, D. C., March 23, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I take the liberty of calling your attention to one point in the "Richmond" competition which you seem to have overlooked in your editorial of the 21st in relation to the conditions of a new programme. They require a building four sides or fronts of granite; four stories and basement in height; covering a lot 140′ x 248′; with elevators, heating, plumbing, etc. and all to be *fire-proof,* for the sum of $300,000.

Now, allowing low stories for the building, it must cost only about thirteen cents a cubic foot to come within the sum and conditions named. The cheapest government building of a fire-proof character that has been erected, I understand from reliable authority, cost thirty-six cents a cubic foot, and this was when labor and material were lower than they are at present. Government buildings, let to the lowest bidder, of the same character as the Richmond building is required to be by the "information" furnished, usually cost from forty to forty-five cents per cubic foot. Of course no one could conscientiously make plans for a building that would cost at least $800,000, in the vain hope that some bidder might be foolish enough to agree to build for $300,000. There should be either greater liberty as to character of building, or the price should be increased.

Yours truly, GLENN BROWN.

A QUESTION IN FIRE-PROOFING.

TENAFLY, N. J., March 11, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — As a builder I am constructing here, for the owner, a one-story brick fire-proof factory, for an extra-hazardous manufacturing business. The factory is forty feet by seventy feet, with concrete floor, and of a height from floor to ridge-pole of pitched roof of eighteen feet. A row of posts through the middle of building is to support the roof in centre. Will you kindly tell me what kind of posts would be best for this roof support? There have been suggested wooden posts, ten inches square, enclosed in wire netting, with coating of plaster-of-Paris, one inch thick. Also, a square box-post, of two-inch plank, say eight inches inside diameter, filled with Portland cement ("set," of course), and covered outside with similar plaster-of-Paris coating. I propose to protect under side of roof-rafters by a wire-net ceiling, with one inch of plaster-of-Paris.

Yours very truly, E.

[THE solid posts, covered with wire-cloth and plastered, would be far better than box-posts filled with cement. The protection of the roof with wire-lath and plaster is very well, and would be particularly good if the rafters could be made of heavy sticks, set five or six feet apart, and covered with plank instead of boarding, and the wire-cloth carried around the rafters, and on the underside of the planking, so as to have no air-space anywhere except the necessary interval between the wire and the wood, for obtaining a clinch to the mortar. Wire-cloth can now be had with corrugations for the nails, so as to need no wood furring-strips, and this would give still more security. It is not necessary to use plaster-of-Paris for the mortar; ordinary lime-mortar will do very well, as the clinch given by the wire-cloth prevents it from crumbling. If plaster-of-Paris or highly-gauged mortar is used, the wire-cloth should first be whitewashed with lime, to prevent the plaster-of-Paris from corroding it. Care should be taken to protect the eaves or cornices from fire which may reach them through the windows. — EDS. AMERICAN ARCHITECT.]

SIZE OF WATER-TANK.

GREENVILLE, S. C.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Will you in your next issue be so obliging as to inform me as to what size tank for supplying water to a water-closet and bath would be necessary if the tank is filled daily? Family consists of six or eight persons. Would it be more advisable that the tank be large enough for a week or even a fortnight?

Respectfully, E. B. RUTLEDGE.

[THERE are so many emergencies likely to arise that it is unsafe to depend upon a tank only large enough for a single day's supply. A tank holding a week's supply is only a reasonable provision to include in an estimate. A tank measuring sixty cubic feet would be as small as it would be safe to provide. — EDS. AMERICAN ARCHITECT.]

WHICH IS THE LARGEST BUILDING IN NEW ENGLAND?

BOSTON, March 7, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Will you kindly inform a reader of your paper as to the following:

1st. Which is the largest building in the New England States? 2d. Which is the largest in Boston? and please state whether it covers the most ground or is largest for room.

By publishing the above information you will confer a great favor and set at rest a dispute between a number of builders and others.

Yours respectfully, F. H. NIMMS.

NOTES AND CLIPPINGS.

AN INGENIOUS SWINDLE. — One day a Parisian, whose wits constituted his sole capital, saw an eligible plot of building land at the corner of two streets, and reflected that the man who built a house there would be a lucky fellow. Some twenty yards further away he noticed another eligible plot of building land covered with building materials. On inquiry he discovered that the corner plot belonged to a Breton nobleman, who had had losses on the Bourse, and was living economically in Bretagne to recuperate. The plot with the building materials on it had belonged to a celebrated doctor who died a couple of years ago, and about whose will an action has been pending for the last eighteen months before the courts of Auvergne. Our swindler, sure of not being disturbed for some time, at once went to a young architect, and got him to make the plans for a fine mansion at the corner. After having approved of the plans, he authorized the architect to make an agreement with a contractor and to use the materials on the other plot, which he said was also his. The work went merrily on, and the sharper brought a few old ladies, to whom he had sold shares in gold and silver mines in improbable regions, to admire it. At the sight of such splendid security they did not hesitate to advance him all the funds he asked for. Everything has an end here below. One day the Breton nobleman came to Paris and went to look at the land that want of means compelled him to leave unproductive. He was of course delighted at the agreeable surprise that met his gaze, and inquired of the builder who was the unknown benefactor to whom he owed it. The builder referred him to the architect, who referred him to the pseudo-owner, but the latter had not been home for many days. He was, in fact, in Mazas prison on account of some imprudent act he had committed in the neighborhood of the Bank of France. His affair, as the French say, was clear; nor did he attempt to deny it. Only during his trial he was seized with a fit of irrepressible laughter. On the judge reprimanding him, and asking him what he saw in the matter to make him laugh, he apologized, and said that he could not help laughing when he thought of the intricate maze of actions-at-law his building freak would cause. The series is indeed a long one, and has already begun. The contractor sues the architect, the architect the Breton nobleman, who maintains that whatever is on and under his land belongs to him; the Auvergnat heirs also sue the Breton for the materials, and the old ladies sue everybody else, pleading that the land, building and materials belong to them as security for the money advanced. Such is the substance of a story told by the Parisian correspondent of the *Manchester Evening News.*

ICE PALACES. — Ice is hardly to be classed as a building material, save among the Innuits, but the ice palaces erected at Montreal, at the winter carnival during the last three years show what can be accomplished with ice if the temperature is always below the freezing point of water. The ice palace is erected in the Dominion Square, at Montreal, being built out of blocks of ice 3 feet 4 inches square and 15 inches thick; 16,000 of these were used in this structure, which covers an elliptical area 120 feet by 160 feet. At each end are embattled towers 38 feet high, and at the sides, pairs of round towers extend to a height of 44 feet. Arched entrances between these towers lead to the interior. The main tower at the centre of the palace reaches to a height of 100 feet, and is connected to the other series of towers by walls. When the blocks of ice are brought from the Lachine Canal and trimmed to dimension, a little water is poured over the bed of the block and at the interstices at the sides until securely frozen in place. The interior of the palace is illuminated with electric lights, and at the storming of the palace, fireworks are thrown over the structure, both from within and from the square. The first ice palace built at Montreal, in January, 1883, had a roof made of boughs which was rendered solid by water thrown upon them, but for the last two years no attempt has been made at a roof. The ice decorations of this city for the carnival are not limited to the palace, for in the Champ de Mars, a structure, called from its Hindoo origin "the Condora," is built from 12,000 blocks of ice. In outline it is a stepped cone, 50 feet in diameter, 100 feet in height, and surmounted by a snow statue 24 feet in height, representing a Canadian with snow-shoes. In its construction the Condora is built of concentric walls increasing in height as the diameter decreases. It is approached from the interior, and during the times of celebration hundreds of the members of the snow-shoe clubs can stand on the tiers encircling the Condora, and add to the brilliancy by torches and fireworks. The architect of the Condora is Theodore Daoust, of Montreal. The third ice structure is the colossal statue of a lion modelled by Arthur Vincent, of Montreal, and situated in the Place d'Armes. The pedestal is 20 feet high and surrounded by four buttresses, the main portion being hollow and illuminated by electric lights, which impart a very fine effect at night. The lion was built up of snow and afterwards wetted, so that it is frozen into a hard mass. Many years ago a life-size statue of a lion was cut out of ice at Lubeck, by a German named Von Meinert. The only precedent of any similar ice palace is probably the one built on the banks of the Neva at St. Petersburg in 1740 for the Empress Anne. This was a smaller structure, covering an area of 13 feet by 56 feet, and measuring 21 feet to the top of the roof, but the published accounts of the elaboration of the ice ornaments suggest the possibility that

Far and wide the tale was told,
Like a snowball, growing as it rolled.

It is alleged that the ice window frames were colored to represent green marble, while the panes were formed of sheets of ice so thin as to form a perfect substitute for glass. The palace was guarded by six cannon with their carriages, all of ice. One-twelfth of the usual charge of powder — not ice this time — was used in this ordnance; and the penetration of the projectile was sufficient to pierce a two-inch board at 60 paces. An ice elephant with his mahout and several dolphins, without their Proserpine, projected fountains of lighted naphtha to a height of 24 feet. Fireplaces and dining-tables, dressing-rooms and baths, are included in the schedule of furnishing, but when the account further states that the drawing-room contained a timepiece with wheels of ice, it seems as if the description was not limited to frozen truth. —*Engineering.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

313,480. BRICK, TILE, DRAIN-PIPE, ETC. — Henry Dickson, Pittsburgh, Pa.
313,491. STONE-LIFTER. — Robert N. Gowell, Ashburnham, Mass.
313,492. VENTILATOR. — Charles E. Granniss, New Haven, Conn.
313,501. FIRE-PROOF BUILDING MATERIAL.—John C. Kerner, St. Louis, Mo.
313,503. FASTENING FOR MEETING-RAILS OF SASHES.—Edward O. Ladd, Everett, Mass.
313,506. METHOD OF ATTACHING SLATES TO ROOFS. — George Martin, Boston, Mass.
313,511. BALCONY AND FIRE-ESCAPE COMBINED.—Cleophas Monjeau, Middletown, O.
313,522. HARDENING AND COLORING SERPENTINE ROCK.—J. J. Pratt, Wakefield, Mass.
313,535. WOOD ORNAMENTATION. — Wm. H. Roystone, Corona, N. Y.
313,540. BENCH-PLANE.—Roscoe S. Sheldon, North Greenfield, Wis.
313,550. HYDRAULIC LIFT. — John S. Stevens and Charles G. Major, Battersea, County of Surrey, and Thos. W. Barber, Ulverston, County of Lancaster England.
313,559. ADJUSTABLE ROOF. — Louis D. Vogel, Boone, Iowa.
313,580. COMBINED SASH-FASTENER AND SASH-LIFT.—George L. Elliott, New York, N. Y.
313,590. HASP-LOCK.—Ephraim Hambujer, Detroit, Mich.
313,594. LATCH.—Samuel Ide, Medina, N. Y.
313,611. SMOKE-CONSUMING FURNACE. — Orel D. Orvis, New York, N. Y.
313,617. TOOL FOR MAKING BEADINGS OR MOULDINGS. — Lawrence V. Poole and Orlando E. Williams, Windsor, Vt.
313,620. GUTTER FOR SEWERS. — Gustavus W. Rader, New York, N. Y.
313,626. HAND-EASEL. — Harriet A. Sawyer, St. Louis, Mo.
313,638. SASH-FASTENER. — Nelse Wilson, Hutto, Tex.
313,643. STONE-SAWING MACHINE.—R. Lester Barney, Swanton, Vt.
313,674. WINDOW-BEAD FASTENER. — Edwin A. Johnson, Allegheny City, Pa.
313,675. FIREPLACE.—Rueben R. Jones, Sprague, Wash. Ter.
313,687. WINDOW-SASH PULL.— Henry B. Sargent, New Haven, Conn.
313,692. DOOR-KEY. — Thomas Taylor, Norwalk, Conn.
313,694. JOINER'S PLANE. — William Tidgewell, Middletown, Conn.
313,709. FIRE-ESCAPE.—Henry Chamberlain, Waupaca, Wis.
313,722. KNOB-ATTACHMENT. — John J. Gordon, Detroit, Mich.
313,723. LEVELING-INSTRUMENT. — Christian C. Götze, Cöthen, Germany.
313,724. AUTOMATIC FIRE-EXTINGUISHER. — Almon M. Granger, Medford, Mass.
313,739. AUGER-HANDLE. — William A. Ives, New Haven, Conn.
313,742. THRESHOLD.—Simon A. Kintner, Ney, O.
313,769. EAVES-TROUGH HANGER. — George Reznor, Mercer, Pa.
313,823. COMPOSITION FOR CURING PAVING-BLOCKS OR BRICKS.—Thomas A. Huguenin, Charleston, S. C.
313,842. DEVICE FOR PREVENTING ACCIDENTS IN ELEVATORS.—Marcus L. Wright, Newton, N. J.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report twenty-seven permits have been granted, the more important of which are the following: —
F. S. & G. L. Brown, two-st'y brick machine-shop, 43' x 90', n e cor. Fort Ave. and Patapsco St.
Mary J. Lindall, etc., 3 three-st'y brick buildings, w s McKim St., n of Chase St.
G. W. Moke, Jr., 15 two-st'y brick buildings, e s Vincent Alley, n of Baltimore St.
Aug. Degenhart, 4 three-st'y brick buildings, s s Preston St., between Valley St. and Holland Alley.
Thos. H. Black, 2 two-st'y brick buildings, w s Holbrook St., s of Hoffman St.
J. W. Gilpin & Bro., one-st'y brick warehouse, 35' x 100', s s Fort Ave., between Webster and Boyle Sts.

Boston.

BUILDING PERMITS.— *Wood.* — *M St.*, *No.* 144, dwell. and store, 25' x 40'; Cabel Kimball, owner; Cabel Kimball, builder.
M St., *Nos.* 146-148, 2 dwells., 20' x 31'; Cabel Kimball, owner; Cabel Kimball, builder.
East Seventh St., near H St., dwell., 20' x 31'; John Hooton, owner; E. P. Power, builder.
Evans St., near Milton Ave., stable, 20' x 34'; James Whitney, owner; Jacob Haddock, builder.
East Ninth St., *No.* 509, storage, 22' x 40'; Lyman Locke, owner; Lyman Locke, builder.
Mabreon St., near Ashford St., stable, 18' x 24'; Walter Connery, owner; Poore & Curry, builders.
Skinner St., near South St., dwell., 24' x 31'; Mrs. Dame, owner; Geo. Dame, builder.
Allston St., near Moss Ave., dwell., 27' x 30'; Ferdinand Morse, owner; C. F. Stillings, builder.
Coleridge St., near Short St., dwell., 22' x 23' 6"; Robert Coosbie, owner.
Saratoga St., near Austin Ave., dwell., 23' x 30'; D. Atwood, owner.
Coleridge St., near Bryon St., dwell., 22' x 23'; Robert Coosbie, owner.
Commercial St., near Dorchester Ave., dwell., 18' x 42'; Charles E. Ricker, owner; Charles E. Ricker, builder.
Winslow St., *No.* 32, dwell., 23' x 39'; Thomas Ginan, owner; Thomas Ginan, builder.
Brick.—Greenwich Park, *Nos.* 37-39, 2 dwells., 18' 9" x 41'; W. H. Smith, owner, W. H. Smith, builder.
Carlton St., dwell., 18' 9" x 41'; W. H. Smith, owner; W. H. Smith, builder.
West Greenwich Park, dwell., 41' x 38' 6"; W. H. Smith, owner; W. H. Smith, builder.
West Newton St., *No.* 263, apartment-house, 40' x 45'; H. H. Fitch, owner; J. E. Potter, builder.
Commonwealth Ave., *No.* 206, dwell., 25' x 69' 6"; Mrs. Dennis Flagg, owner; Silas Merrill, builder.
Huntington Ave., *No.* 144, near West Newton St., apartment-house, 45' x 60'; H. H. Fitch, owner; J. E. Potter, builder,

Brooklyn.

BUILDING PERMITS.—*Clason Ave.*, *Nos.* 472 *and* 472 *a*, w s, 299' n Putnam Ave., 2 three-st'y brick dwells., tin roofs, wooden cornices; cost, each, $5,000; owner, etc., J. J. Walker, 474 Clason Ave.
Bremen St., s e cor. Jefferson St., 3 three-st'y frame (brick-filled) stores and tenements, tin roofs; cost for all, $16,000; owner, etc., Joseph Frisse, 19 Ten Eyck St.
Park Ave., *Nos.* 751 *and* 753, n s, 62' w Delmonico Pl., 2 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $4,500; owners, Joseph Merk and Joseph Auer, cor. Delmonico Pl. and Park Ave.; architect, Th. Engelhardt; builders, Val. Bruchhaeuser and Joseph Frisse.
Park Ave., *No.* 691, n s, 275' w Tompkins Ave., three-st'y frame store and tenement, tin roof; cost, $4,000; owner and builder, John Eich, on premises; architect, Th. Engelhardt.
Bushwick Ave., *Nos.* 565 *and* 567, n e cor. Troutman St., 5 three-st'y frame stores and tenements, tin roofs; total cost, $25,000; owner, architect and builder, Jos. Frisse, 19 Ten Eyck St.
Graham Ave., n s, cor. Siegel St., three-st'y frame tenement, tin roof; cost, $3,000; owner and builder, Christian Bott, 92 Humboldt St.; architect, Th. Engelhardt.
Graham Ave., n e cor. Siegel St., four-st'y frame store and tenement, tin roof; cost, $7,500; owner, architect and builder, same as last.
Lincoln Pl., *Nos.* 129-137, n s, 225' w Seventh Ave., 5 three-st'y dwells., tin roofs; cost, each, $9,000; owner and builder, Wm. Gubbins, 20 Seventh Ave.; architect, C. Werner.
Monroe St., *No.* 642, s s, 372' 6" e Stuyvesant Ave., 3 two-st'y brick dwells., tin roofs; cost, each, $3,500; owner and builder, Cornelius King, 531 Clason Ave.; architect, Geo. I. Chappell & Co.
Evergreen Ave., w s, 25' 6" n Woodbine St., two-st'y frame (brick-filled) dwell., tin roof; cost, $3,000; owner, M. D. Booth, Evergreen Ave. and Woodbine St.; architects and builders, Simpson & Lowe.
Eighth St., n s, 350' e Seventh Ave., 8 two-st'y brown-stone dwells., tin and wooden roofs; cost, each, $5,000; owner, Charles Long, 450 Ninth St.; builder, J. F. Wood.
Twenty-first St., *Nos.* 153 *and* 155, n s, 185' w Fourth Ave., 2 four-st'y frame tenements, tin roofs; cost, each, $4,000; owner, M. E. Conlon, 117 Albany Ave.; architect and builder, J. E. Conlon.
Quincy St., s s, 250' w Reid Ave., two-st'y basement and attic brick dwell., tin and metal roof; cost, $5,500; owner and builder, Samuel Post, 815 Van Buren St.; architect, H. Vollweiler.
Quincy St., s s, 270' w Reid Ave., 10 two-st'y brick dwells., tin roofs, iron cornices; cost, each, $5,500; owner, architect and builder, same as last.
Hudson Ave., w s, 190' n Myrtle Ave., three-st'y brick tenement, gravel roof, wooden cornice; cost, $3,500; owner, Jos. B. Durfey, 158 Park Pl.; architect, Charles Werner; builders, L. MacNaughton and John Prosser.
Quincy St., n s, 200' w Sumner Ave., 5 two-st'y brown-stone dwells., tin roofs; cost, each, $5,000; owner, Wm. Johnstone, 224 St. Johns Pl.; architect, I. D. Reynolds.
Bergen St., s s, 125' e Nevins St., four-st'y brick tenement and one-st'y brick stable, tin roof; total cost, $10,000; owner, John Harvey, 627 East Sixteenth St., New York; architect, I. D. Reynolds; builder, O. Nolan.
Linden St., n s, 200' w Bushwick Ave., 4 two-st'y brick dwells., tin roofs; cost, each, $4,000; owner, S. M. Meeker, 64 Broadway; architect, E. F. Gaylor; builder, J. Rueger.
Van Cott Ave., or *Fifth St.*, s s, 156' 6" e Union Ave., one-st'y brick smelting-works, tin roof; cost, $4,000; owner, D. Culhane, 87 Fourth St.; architect, A. O. Hoddick.
Marion St., n e cor. Howard Ave., 4 two-st'y frame dwells., brick-filled; cost, each, $2,500; owner and architect, Augustus B. Pettit, 283 Chauncey St.
Sixth Ave., s w cor. Prospect Ave., 10 three-st'y frame tenements, tin roofs, iron and brick cornices; cost, average, $3,500; owner, architect and builder, James H. Darrow, 490 Eighth Ave.
Halsey St., n s, 178' 6" w Broadway, three-st'y brick car-house and stable, gravel roof; cost, $35,000; owners, Brooklyn City R. R., 10 Fulton St.; architect, A. W. Dickie.
Manhattan Ave., *No.* 215, four-st'y brick store and tenement, tin roof, iron cornice; cost, $9,000; owner, W. Heinrichs, 122 Franklin St.; architect, H. Vollweiler.
Vernon Ave., n s, 40' w Sumner Ave., 2 two-st'y brown-stone dwells., tin roofs; cost, $4,500 each; owner, Adela Loughi, Willoughby Ave., cor. Sumner Ave.; architect and builder, A. Miller.
Garden St., e s, *No.* 25, three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner, Martin Stumph, 245 Stanton St., New York; architect, H. Vollweiler.
Frost St., *No.* 189, n s, 50' w Humboldt St., three-st'y frame tenement, tin roof; cost, $4,000; owner, John H. McKenna, 106 Skillman Ave.; architects and carpenters, Sammis & Bedford; masons, Doyle & Brazil.
Johnson St., *Nos.* 240 *and* 244, s s, 40' w Raymond St., 3 three-st'y brick tenements, tin roofs; total cost, $10,000; owner and builder, Peter Barrett, 246 Johnson St.; architect, J. M. Farrell.
Floyd St., *No.* 129, three-st'y frame (brick-filled tenement, tin roof; cost, $3,000; owner, Mrs. M. Mullen, 131 Floyd St.; architect, C. F. Eisenach.
Montague St., n s, 81' e Hicks St., seven-st'y apartment-house, mansard, slate and metal roof; cost, $55,000; owner, W. Zeigler; architects, Parfitt Bros.; superintendent of construction, W. C. Bush.
Montague St., n s, about 157' e Hicks St., 2 seven-st'y apartment-houses; mansard, slate and metal roofs; total cost, $140,000; owner, Henry Weil; architect, etc., same as last.
Quincy St., n s, 225' e Sumner Ave., 6 three-st'y brown-stone dwells., tin roofs; cost, each, $5,000; owner, Wm. Godfrey, 348 Monroe St.
Maujer St., n s, 125' e Graham Ave., 3 four-st'y frame (brick-filled) stores and dwells., tin roofs; cost. each, $4,000; owner and builder, Wm. Young, 290 Devoe St.
Grand St., *No.* 566, 75' w Humboldt St., four-st'y brick store and tenement, tin roof; cost, $6,000; owner and architect, Phillip Light; builders, Ulrich Maurer and Michael Metzen.
Butler St., n s, 280' w Bond St., three-st'y brick tenement, tin roof; cost, $4,000; owner, Mary Lynch, 604 Carroll St.; architect, I. D. Reynolds.
Jackson St., *No.* 110, s s, 125' w Ewen St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,500; owner, Jacob Zermann, on premises; architect and builder, J. J. Smith.
Middleton St., n s, 100' w Harrison Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner and builder, F. Mossetter, Harrison Ave., cor. Middleton St.; architect, Th. Engelhardt.
Humboldt St., *Nos.* 75, 77, 79 *and* 81, n w cor. Moore St., 4 three-st'y frame (brick-filled) stores and tenements, tin roofs; cost, each, $4,000; owner and builder, Christian Bott, 92 Humboldt St.; architect, Th. Engelhardt.
Atlantic Ave., s s, 391' 4" e Utica Ave., 8 two-st'y frame (brick-filled) dwells., gravel roofs; cost, each, $1,800; owner, Thomas Quinn, Franklin Ave. and Butler St.; architect, Amzi Hill; builders, W. S. Montgomery and D. Smith.
Putnam Ave., n s, 295' e Tompkins Ave., 5 two-st'y and three-st'y in rear brown-stone dwells., tin roofs; cost, each, $5,500; owner, etc., Arthur Taylor, 329 Herkimer St.

ALTERATIONS. — *Broadway*, s e cor. Third St., new store-fronts, etc.; cost, $4,000; owner, James L. Truslow, 45 Broadway; architect, E. F. Gaylor; builders, Jenkins & Gillies.
Broadway, *No.* 1227, add two stories; cost, $3,000; owner, F. Graeber, on premises; architect, F. Holmberg; builder, not selected.

Chicago.

BUILDING PERMITS. — J. Rivers, three-st'y flats, 704 Eighteenth St.; cost, $3,500.
J. Sokup, three-st'y store, 1228 Milwaukee Ave.; cost, 13,000; architects, Schaub & Berlin.
C. Kahler, three-st'y store and dwell., 478 Ogden Ave.; cost, $6,000.
M. McNellis, two-st'y dwell., Loomis St.; cost, $4,000.
H. H. Gage, two-st'y store, 242 Lake St.; cost, $4,000.
Mrs. S. Anderson, two-st'y store and dwell., 2944 Wentworth Ave.; cost, $4,000.
J. B. Whitmore, two-st'y dwell., 969 Central Park Ave.; cost, $2,500.
B. Machowski, two-st'y dwell., 413 Seventeenth St.; cost, $2,800.
Ed. Lehman, 2 three-st'y store and dwell., 487-489 Ogden Ave.; cost, $8,000; architects, R. Ray, Jr. and Wm. Drake.
F. B. Clark, 4 three-st'y store and dwells., 876-878 West Polk St.; cost, $14,000; architect, R. Ray, Jr.
H. Sortman, three-st'y dwell., 200 North Green St.; cost, $3,500; architect, Wm. Drake.
M. Hickman, two-st'y flats, 15 Warren Ave.; cost, $5,000; architect, W. Strippleman.
J. Pietsch, two-st'y flats, 751 Jefferson St.; cost, $3,000.
S. Blaisdell, three-st'y stores and dwells., 436 Ogden Ave.; cost, $5,500; architects, Edbrooke & Burnham; builder, W. P. Fitzpatrick.
T. Davies, three-st'y store and dwell., 413 Ogden Ave.; cost, $4,500; architect, R. Ray, Jr.
T. Pepper, three-st'y store and dwell., 3204 South Robey St.; cost, $3,000.
A. B. Peck, three-st'y store and dwell., Chicago Ave.; cost, $15,000; architect, J. Addison.
Mrs. L. M. Hopkins, two-st'y flats, 488 Hermitage Ave.; cost, $3,500.
Lauthmann & Rosenbaum, 2 three-st'y store and dwell., 238-240 Division St.; cost, $12,000.
J. W. Odell, two-st'y barn; cost, $2,500.
C. C. Wiedling, two-st'y store and dwell., 241 West Forth Ave.; cost, $7,000; architects, Schaub & Berlin; builders, Eich & Otto.
Mrs. George, two-st'y dwell., 501 Ogden Ave.; cost, $2,700.
O. Coyne, four-st'y store and dwell., 923 Blue Island Ave.; cost, $8,000; architect, R. B. Lawrence.
J. Campbell, 2 basements, 152-154 North Green St.; cost, $3,000.
The Board of Education, three-st'y school-house, Ashland and Waubansia Aves.; cost, $40,000; architect, J. J. Flanders; builder, J. Oleson.

Cincinnati.

STORES.—Mr. J. M. Rawson is to build on the s w cor. of Sixth and Elm Sts., a six-st'y building for stores. The upper floors being arranged so they can be

divided into offices. The lot is 90′ on Elm St., and 123′ on Sixth St.; cost not yet estimated; architect, Jas. W. McLaughlin.

Correction.—A statement published in a contemporary journal that Mr. McLaughlin was preparing plans for a new building on the cor. of Fifth and Vine Sts., for the Este estate is denied by Mr. McLaughlin. There was some talk of building on the site, but the matter has been dropped.

Building Permits. — Jno. H. Brockman, three-and-one-half-st'y brick dwell., Logan St.; cost, $4,200.

Kirk & Co., two-st'y brick dwell., s s Third St., bet. Plum and Central Aves.; cost, $4,000.

B. Thoman, four-st'y dwell., bet. Woodward St. and Broadway; cost, $2,700.

Peter Motch, three-st'y brick dwell., Camp Washington; cost, $4,000.

Mrs. E. H. Camp, two-st'y brick dwell., 217-219 Plum St.; cost, $3,000.

David Rahl, three-st'y brick dwell., Race St., bet. Twelfth and Thirteenth Sts.; cost, $3,500.

James Hunt, two-st'y brick dwell., Elm St., near Eighth St.; cost, $3,500.

C. C. Rendigs, four-st'y brick dwell., Broadway and Abigail St.; cost, $5,500.

P. Steinbrecker, two-and-one-half-st'y brick dwell., bet. Kenton and Wilken Sts.; cost, $2,800.

Stephenson Estate, four-st'y brick dwell., Clinton St., near Baymiller; cost, $7,800.

Peacock Bros., to repair house, 59-61 Elm St.; cost, $3,700.

T. Mulhvihill, two-st'y brick dwell., 222 Sycamore St.; cost, $3,000;

Jno. Matre, four-st'y brick dwell., n e cor. McMicken St.; cost, $9,000.

Wm. Scully, two-and-one-half-st'y brick dwell., Calhoun St.; cost, $4,000.

Mrs. Kirby, 3 five-st'y brick dwells., McMicken Ave.; cost, $9,000.

Jno. H. Fauger, repairs three-st'y brick dwell., Plum St.; cost, $8,000.

U. Herterbrink, four-st'y brick dwell., n s Elm St.; cost, $10,000.

E. Berger, three-and-one-half-st'y brick dwell., Hopkins St.; cost, $3,000.

Este Estate, remodel front, 135 Main St.; cost, $2,000.

Jno. Dinkelhihler, three-st'y brick dwell., s e cor. Ancord St.; cost, $8,000.

J. D. Moore, 2 four-st'y brick dwells., Court St.; cost, $6,000.

Sam. Taft, three-st'y brick dwell., Central Ave., near Third St.; cost, $5,000.

Woodward & Cleckler, two-st'y frame dwell., s s Warner St.; cost, $2,000.

J. Hoeffle, three-st'y brick dwell., Calhoun St.; cost, $7,000.

L. B. Harrison, five-st'y brick dwell., w s Race St.; $10,000.

Geo. Hutink, two-st'y brick dwell., w s Madison St.; $3,500.

Trustees First Presbyterian Church, chapel, Kibby St.; cost, $4,500.

R. Wooley, Jr., two-and-one-half-st'y brick dwell., Crown St.; cost, $12,000.

P. Windman, two-st'y brick dwell., 840 Vine St.; cost, $5,000.

C. Sahlfield, five-st'y brick dwell., 479 Main St., cost, 7,600.

C. Raner, two-st'y brick dwell., n s Euclid St., near Boone St.; cost, $2,200.

G. Henzerling, three-st'y brick dwell., w s Denman St.; cost, $3,900.

Mrs. Zehler, two-and-one-half-st'y brick dwell., n s Vine St., w of Ohio Ave.; cost, $5,000.

F. Weimer to build three-st'y brick dwell., Cumminsville; cost, $2,100.

Repairs and additions, $24,330.
Total permits to date, 103.
Total amount to date, $320,000.

New York.

Factory.—On the w s of Tenth Ave., from One Hundred and Fifty-first St. to One Hundred and Fifty-second St., three-st'y silk-factory, 100′ x 200′, is to be built for Messrs. Joseph Loth & Co., at a cost of $100,000, from plans of Messrs. Hugo Kafka & Co.

Houses.—Mr. C. O'D. Iselin will have a residence, 25′ x 90′, built on the n s of Fifty-second St., 175′ e of Fifth Ave., at a cost of $50,000, from plans of Richard M. Hunt.

Six three-st'y and basement brick and brown-stone dwells., 17′ x 50′ each, are to be built on the n s of Ninety-first St., w of Lexington Ave., at a cost of about $60,000, from plans of Messrs. Schwarzmann & Buchmann.

Office-Building. —The Astor Estate have ordered plans to be prepared for the enlargement of their Broadway building, now being erected. The extension will occupy the lots No. 3 and 5 Pine Street and No. 6 Wall Street. The cost of the improvement will be $200,000; Mr. Wm. Schickel is the architect.

Store. — On the n w cor. of Third Ave. and Fifty-ninth St., five-st'y basement and sub-cellar building, 100′ x 145′, is to be built for Messrs. Bloomingdale Bros., at a cost of $160,000, from plans of Messrs. Schwarzmann & Buchmann.

Building Permits.— *Fourth Ave.*, e s, 65′ 1″ s One Hundred and Tenth St., four-st'y brick dwell. and workshop, gravel roof; cost, $7,800; owner, Denis W. O'Halleran, 405 East One Hundred and Sixteenth St.; architect, C. Baxter.

Lexington Ave., s e cor. Eighty-eighth St., five-st'y brick tenement, tin roof; cost, $35,000; owner, John P. Thornton, 531 East Eighty sixth St.; architect, F. T. Camp.

Eighty-sixth St., s s, 175′ e Second Ave, 2 four-st'y brown-stone front tenements, tin roofs; cost, each, $15,000; owner, James Barry, 312 East Eighty-sixth St.; architect, H. L. Harris.

Ave. A, n e cor. Eighty-fifth St., five st'y brick tenement and store, tin roof; cost, $20,000; owner, Mathias H. Schneider, 419 East Eighty-first St.; architect, J. Kastner.

Ave. A, e s, 25′ 8″ n Eighty-fifth St., 3 five-st'y brick tenements and stores, tin roofs; cost, total, $45,000; owner and architect, same as last.

Eighty-fifth St., n s, 72′ e Ave. A, five-st'y brick tenement, tin roof; cost, $15,000; owner and architect, same as last.

East Sixty-first St., Nos. 342 *and* 344, 2 five-st'y brick tenements and stores, tin roofs; cost, total, $30,000; owner, Margaret O'Sullivan, 74 East One Hundred and Twelfth St.; architect, R. Rosenstock.

Tenth Ave., e s, extending from Ninety-second to Ninety-third St., four-st'y brick building (Home for the Aged), tin roof; cost, $125,000; owner, Methodist Episcopal Church Home, Anna A. Harris, President, 25 East Eighty-first St.; architects, D. & J. Jardine.

Home St., n w cor. Tinton Ave., 4 two-st'y frame dwells., tin roofs; cost, each, $2,300; owner, architect and builder, John Knox, 1167 Union Ave.

North Third Ave., w s, 48′ n One Hundred and Thirty-ninth St., four-st'y brick store and tenement, tin roof; cost, $11,000; owner, John Demarest, 380 Mott Ave.; architect, H. S. Baker; builders, R. Hargrove and N. Douglas.

Greene St., s w cor. Houston St., 2 six-st'y brick stores, tin roofs; total cost, $150,000; owner, Wm. Astor, 23 West Twenty-sixth St.; architect, W. Schickel.

Duane St., Nos. 177 *and* 179, six-st'y brick store, tin roof; cost, $18,000; owners, John J. Jenkins, 247 West Twenty-third St., and John I. Lagrave, 17 East Fifty-third St.; architects and builders, F. & W. E. Bloodgood.

Grand St., No. 586, five-st'y brick tenement and store, tin roof; cost, $11,000; owner and architect, Wm. R. Foster, 28 Canal St.; builders, Peter Tostevin's Sons and Guy Culgin.

Henry St., s e cor. Clinton St., four-st'y brick tenement, tin roof; cost, $8,000; owner, John F. Huner, 226 Madison St.; architect, George Vassar, Jr.

Suffolk St., No. 24, six-st'y brick tenement, tin roof; cost, $19,000; owner, Charles Malevista, 95 Orchard St.; architect, W. Graul.

West Broadway, Nos. 123 *and* 125, six-st'y brick store, tin roof; cost, $35,000; owners, Ella V. A. Dayton, 256 West Fifty-seventh St. and others; architect, John C. Burne.

Tenth St., No. 196, five-st'y brick and brown-stone tenement, tin roof; cost, $22,000; owner, Anthony Richert, 26 East Thirty-first St.; architect, W. Graul.

West Sixteenth St., No. 528, two-st'y brick factory, tin roof; cost, $4,000; owner, Amedee Castaing, 422 West Fifteenth St.; architect, W. C. Westervelt.

Thirtieth St., s s, 100′ e First Ave., five-st'y brick factory, tin roof; cost, $40,000; owner, Jacob Doll, 321 East Thirteenth St.; architect, Chas. Sturtzkober.

West Nineteenth St., No. 124, six-st'y brick and stone store and lofts, tin roof; cost, $25,000; owner, Edward Janson, 120 West Nineteenth St.; architect, J. Hoffmann.

Broadway, n e cor. Fifty-third St., 5 one-st'y brick stores, tin roofs; total cost, $12,000; owner, Cecile Rusch, Bergen, N. J.; architect, C. C. Haight; builder, L. H. Williams.

Tenth Ave., w s, 25′ n Forty-seventh St., 5 five-st'y brick tenements, tin roofs; cost, each, $15,000; owner, Chas. Lindner, First Ave., s e cor. Sixth St.; architects, A. Pfund & Son.

Sixty-third St., s s, 200′ e Second Ave., rear, three-st'y brick stable, gravel roof; cost, $8,500; owner, Mary D. Peyster, 112 East Thirty-sixth St.; architect, Emlen D. Littell; builders, Moran & Armstrong.

Seventy-seventh St., s s, 175′ w Second Ave., 2 five-st'y brick tenements and stores, tin roofs; cost, each, $18,000; owner, Henry Lipman, 142 East Seventy-second St.; architect, G. W. Spitzer.

Seventy-fourth St., n s, 70′ w Third Ave., five-st'y brown-stone front tenement and store, tin roof; owner, Christian F. Bruggemann, 175 East Seventy-fourth St.; architect, J. H. Valentine.

One Hundred and Fourth St., n w cor. Fourth Ave., four-st'y brown-stone tenement, tin roof; cost, $12,000; owner, architect and builder, Wm. Fernschild, 324 East One Hundred and Fourteenth St.

One Hundred and Sixth St., s s, 130′ w Fourth Ave., 3 four-st'y apartment-houses, tin roofs; cost, each, $20,000; owner, Hugh McGillivray, 1611 Lexington Ave.; architect, John C. Burne.

Eighty-seventh St., n s, 106′ 6″ e First Ave., 8 five-st'y brick (stone-trimmed) tenements, tin roofs; cost, each, $18,000; owner, Thomas Moore, 240 East Seventy-first St.; architects, Thom & Wilson.

Sixty-second St., s s, 200′ e Tenth Ave., five-st'y brick tenement, tin roof; cost, $13,000; owner, Julia Renaud, 243 West One Hundred and Thirty-first St.; architects, Cleverdon & Putzel.

Sixty-second St., n s, 100′ w Ninth Ave., 5 five-st'y brown-stone tenements, tin roofs; owners, Gillie, Walker & Lawson, 538 West Fifty-first St.; architect, M. L. Ungrich; builder, days' work.

One Hundred and Twenty-fifth St., s e cor. St. Nicholas Ave., 5 five-st'y brick stores and tenements, tin roofs; owner, Jas. Cassidy, One Hundred and Twenty-fourth St. and St. Nicholas Ave.; architect, Geo. J. Carey.

Ninth Ave., s w cor. Ninety-third St., five-st'y brick and Vermont marble apartment-house, tin roof; cost, about $150,000; owner, Mrs. E. S. Auchmuty, 61 University Pl.; architects, Renwick, Aspinwall & Russell; builder, The New York Trade School.

One Hundred and Twenty-ninth St., n s, through to One Hundred and Thirtieth St., 425′ e Twelfth St., three-st'y brick car-house and stable, gravel roof; cost, $40,000; owner, St. Nicholas Construction Co., Daniel D. Wylie, President, 697 Madison Ave.; architects, Thayer & Robinson; builder, Thos. Dobbin.

One Hundred and Thirty-second St., n s, 275′ w Seventh Ave., 8 three-st'y and basement brown-stone front dwells., tin and slate roofs; cost, each, $8,000; owner, Isaac E. Wright, 1983 Madison Ave.; architects, Cleverdon & Putzel.

Seventh Ave., w s, between One Hundred and Forty-fifth and One Hundred and Forty-sixth Sts., two-st'y frame engine repair-shop, tin roof; cost, $17,000; owner, etc., Manhattan R. R. Co., 71 Broadway.

Eighth Ave., e s, between One Hundred and Forty-fifth and One Hundred and Forty-sixth Sts., three sections of trestle-work, all joined for storing cars, etc., to be one-st'y high, and of yellow pine; cost, $21,000; owner, etc., same as last.

Bathgate Ave., w s, 185′ 5″ s One Hundred and Seventy-seventh St., two-st'y frame dwell., shingle roof; cost, $3,000; owner, E. S. Westcott, 1882 Washington Ave.; builder, Wm. R. Holder.

One Hundred and Thirty-third St., s s, 200′ e Willis Ave., one-st'y frame dancing-platform, tin roof; cost, $10,000; lessee, August Baur, Southern Boulevard and Willis Ave.; architect, A. Arctander.

One Hundred and Forty-ninth St., n s, 125′ e Courtlandt Ave., four-st'y brick and frame tenement, tin roof; cost, $6,000; owner, George Ott, One Hundred and Forty-ninth St., near Third Ave.; architect, Julius Kastner.

One Hundred and Sixty-ninth St., s s, 50′ w Union Ave., three-st'y frame dwell., tin roof; cost, $4,000; owner, Peter Lotz, 989 East One Hundred and Sixty-ninth St.; architect and builder, Louis Falk.

Third Ave., n w cor. One Hundred and Forty-first St., 2 four and three st'y brick tenements and stores, tin roofs; total cost, $23,000; owner, John Bates, 527 East One Hundred and Forty-first St.; architects, Cleverdon & Putzel.

Alterations.—*Tenth St., No.* 175, four-st'y brick extension, tin roof; cost, $5,000; owner, David Braham, on premises; builders, Dennis Ryan and C. Munch.

Seventh St., No. 58, raise attic to full story, new flat roof, and a four-st'y brick extension, tin roof; cost, $10,000; owner, Ellen T. Mitchell, on premises; architects, Babcock & McAvoy.

Broad St., w s, 100′ s Wall St. (Stock Exchange), lay wooden floor, etc.; cost, $10,000; owner, New York Stock Exchange; architect, J. R. Thomas.

Third Ave., n w cor. Fourteenth St., raise part of building one st'y and a brick extension, etc.; cost, $8,000; lessees, Sohmer & Co., on premises; architects, Berger & Baylies; builders, C. W. Klappert's Sons.

Washington St., No. 466, build party-wall on rear, on line of 288 West St.; cost, $8,000; owner, Estate of Robt. Gaston, John Dickson, exr., of 466 Washington St. and the estate of Henry Lucers, of 288 West St.; builders, John D. McBrien and Samuel Smyth.

COMPETITIONS.

CITY-HALL. **[At Richmond, Va.]**

February 16, 1885.

Proposals are invited **until June 1st, 1885,** for furnishing designs for a city-hall upon which premiums will be paid as follows: —

For first best design, $700.
For second best design, $300.

The Committee on Grounds and Buildings of the City Council reserves the right to reject any and all designs.

For information address the undersigned.

487 W. E. CUTSHAW, City Engineer.

TORONTO COURT-HOUSE. **[At Toronto, Ont.]**

City Clerk's Office,
Toronto, Ont., March 4, 1885.

CHANGE OF TIME AND CONDITIONS.

Notice is hereby given that the following amendments have been made to the Instructions to Architects previously issued, viz. : —

(1) That the clause providing for the building being erected in Canadian material be struck out.

(2) That all designs for which premiums are awarded shall be and remain the property of the designer, instead of becoming the property of the city, except the one which is accepted for the erection of the building.

(3) That no prize be awarded to any plan the carrying out of which will exceed $200,000.

(4) That the time for the reception of plans be extended **until the 23d of April, 1885.**

JOHN BLEVINS,
483 City Clerk.

PROPOSALS.

HOUSE OF REFUGE. **[At Hudson, N. Y.]**

House of Refuge for Women,
Hudson, N. Y., March 16, 1885.

Sealed proposals will be received, addressed to J. W. Hoysradt, President of the Board of Managers of the House of Refuge for Women, Hudson, N.Y., or delivered at his office **until 12 o'clock at noon on the 16th day of April, 1885,** for furnishing material and doing work on the buildings for said House of Refuge, for women, to wit: —

The main building, the house of detention or prison, four cottages and hospital, in accordance with plans, drawings and specifications made by W. H. Miller, architect, and now to be seen at the office of the Hudson Iron Company, at Hudson, N. Y., where the superintendent, Charles B. Cure, will exhibit same and furnish copies of specifications and proposal blanks.

Each proposal must be inclosed in a sealed envelope, addressed to Gen. J. W. Hoysradt, Hudson, N.Y., indorsed "Proposal for House of Refuge for Women," and must be accompanied by a bond with two sureties, residents of the State of New York, each in the amount of six thousand dollars guaranteeing that such bidder, if his bid shall be accepted, will execute a contract for the performance thereof by him, and will perform said contract to the full intent of its terms.

Each proposal must contain separate and distinct bids on each of the seven buildings above named. The Board of Managers reserving the right to accept the same as to any one or more of such buildings, and reject it as to the other or others. Also, to reject any and all bids.

Such contract to be made in accordance with the aforesaid plans and specifications, and with such conditions and provisions as the Board of Managers may deem necessary to protect the interests of the state.

J. W. HOYSRADT,
MRS. SARAH L. S. GUERNSEY,
MRS. C. A. SPENCER, } Managers.
JOHN CADMAN,
CHARLES TRACY,

485

THE AMERICAN ARCHITECT AND BUILDING NEWS. MARCH 28, 1885. No. 483.



AUSTIN HALL, HARVARD COLLEGE LAW SCHOOL, CAMBRIDGE, MASS.

H. H. RICHARDSON, Architect.

Heliotype Printing Co., Boston.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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APRIL 4, 1885.

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CONTENTS.

A MOVEMENT about which we confess to have entertained the gravest doubts has recently been initiated in New York, with the idea that it is to be propagated from that centre of intelligence over the whole country. This movement is the one for establishing a National Society of Arts, about which most of our readers have doubtless heard, and has in view "the protection and promotion of the interests of art in the United States." When we first heard of the prospects of founding such an association, we thought, not without consternation, that the grandest arena for the combats over prizes ever seen in the world was about to be opened in this country, and our apprehensions were not wholly allayed until we saw the announcement of the names of the officers chosen by the New York meeting. So long, we are glad to say, as such gentlemen as these control the new society, no opportunity will be given, under its sanction, for exercising those troops of hobbies which find pasturage on the borders of the artistic world. Of all of them, excepting the amateurs, for whom we cannot speak, it may be truly said that they understand art well enough to recognize it in its humblest manifestation, and love it deeply enough to treat every such manifestation, however obscured by falsities, or vulgarisms, with tender regard; and more than this, as expressing our sense of the fitness of these gentlemen to watch over the interests of American art, we should be at loss to say.

CONCERNING the work which the new society is to do, there seems to be a diversity of opinion. Some persons think that its function will consist mainly in the expression of opinions as to the merit of new works of art. It is hardly necessary to say that a truthful society which made that its principal occupation would soon have few members left out of jail, and it is fortunate that no such disagreeable duty will really be expected of it; but as those who control it may perhaps be themselves a little at a loss to know where their new-found influence can be applied to the best advantage, we make bold to lift up our modest voice for the offer of a suggestion which we trust may sometime be useful to them. This suggestion, based on long observation of the circumstances which affect the work of a certain class of artistic workers, is as follows: Take care of the interests of the artists, and the interests of art will take care of themselves. By taking care of the interests of artists we do not mean, of course, collecting provender in the shape of patronage, at random for them, to be carried off by the most selfish and impudent, but the encouragement of industry, the repression of blatant humbug, and above all, the effectual support of artists against the insensible sharks who delight to make them their prey. Long as is the list of architects "done" out of their time and labor by persons who laugh to scorn their requests for payment, that of artists crowded to the wall by lying dealers, deluded by fraudulent competitions, cheated of their pay and defrauded of their reputation by every possible means, must be still longer, and the society, or association, or whatever else it may be called, which shall make a duty of demanding and obtaining justice for these poor people will cheer the hearts of artists wherever its operations may penetrate, in a way which is certain to show itself in their work. As a single instance of the cases in which such aid could be given with immediate good result, we need only mention the scandalous Temple competition, in which a certain prize was offered for the best painting on a given theme which should be presented on a certain day. Most artists of ability and experience know that competitions somehow mean to them nothing but disappointment, loss, and indignation, and very few pictures were presented, but those that did come in were judged and classified, and the author of the best was then coolly informed that in the opinion of the judges his picture was not good enough to have the promised award, and he might content himself without it as best he could. Fortunately for his brother artists, but not for himself, the painter of the best picture could not swallow, with the submissiveness expected of him, either the violation of the contract under which he had spent so much labor, or the wanton insult which accompanied the fraud, and he is now, and has been for a long time, engaged in pursuing through the weary circle of the courts, the wealthy corporation and the irresponsible trustees who care so little about the trouble they have brought upon him. It is evident that he must fail, whatever the verdict may be. Even if the trustees should tire of defending their own misdeeds with other people's money, and give him up his prize, it will bring with it nothing but the consciousness of at least as great a sum, with the peace and happiness of years wasted in the attempt to secure justice from men whose so-called "eminence" among connoisseurs had simply served to delude him. It is very likely that his picture may not have been good, and indeed, it is quite improbable that any artist capable of painting a good one would have engaged in such a competition; but that has nothing to do with the point which we wish to enforce. It is sufficient to say that an artist who entered a competition in good faith is now deprived of the prize which he won in it, and is wearing out his heart in the endeavor to get it. The same thing might happen, and does happen, on a larger or smaller scale, to many artists, good and bad, every day, to the ruin of their peace of mind and to the infinite loss of art. Every one acknowledges this evil, which takes the very life out of honest and quiet art in this country, and sends our best men and women abroad to spend their days in a more congenial atmosphere; but no one has suggested a remedy for it, and it seems to be left for us to say that the best thing that could now be done for art in this country would be for such a body as the National Society of Art to take up the Temple competition case where it now is, and bring it to a speedy, just and public conclusion, for the benefit alike of the community of artists, whom the novel spectacle of justice done to one of their members would warm into an unwonted cheerfulness and courage, and of the laity, who need sorely to be taught that even if their intentions toward artists are right, they cannot with impunity constitute themselves the sole judges of the merit of questions in regard to which they may happen to have a controversy with them.

THE older State Capitols are, as a rule, so poorly built that we are not disposed to mourn much when one of them comes to grief, and when, as was the case a few days ago, one of them is burned down without the total loss of all the valuable records which should not be, but generally are, stored in them, we are tempted to rejoice that the old hulk has departed without worse mischief. The scene of the last occurrence of this kind was Trenton, New Jersey, where the front portion of the present Capitol, containing the original structure, dating from 1790, besides various additions, was, as is supposed, set on fire by an incendiary, and almost entirely gutted by the flames. Fortunately, the Court records and the papers of the Treasurer's and Secretary of State's offices were saved, the principal loss in documents falling upon the Labor Bureau, the contents of which were totally consumed. Unlike some communities, the State of New Jersey is wise enough to insure its property, and will recover indemnity enough to help it materially in rebuilding the whole of the older part of the structure with fire-proof materials, as it is now proposed to do.

A CASE has been discussed in the daily papers which has a certain interest for architects, as casting a little light upon the morals of ordinary competitions, amongst other things. According to the story, a Mr. Ellis, of Rochester,

N. Y., was interested, either for himself or some one else, in a set of competitive drawings for a jail. Discovering, by that mysterious insight which competitors for public works so often possess, that one more vote in the Board of Supervisors would decide the competition in favor of his plan, he sought a member of the Board and offered him a hundred and fifty dollars to vote according to his wishes. The supervisor took the money, but told the story, and Mr. Ellis, under the strict laws of New York, which regard the offer of money to a public functionary with a horror like that with which a Roman would have contemplated an attempt to corrupt a vestal virgin, was arrested, tried, and sentenced to pay a fine and to imprisonment until the fine be paid. It is but proper to say that Mr. Ellis denied that he was guilty, as charged, and will carry the case to a higher court.

IT is with regret, but without chagrin, that we have to announce that our siege of Richmond must be raised, since the authorities, in the person of the city engineer, refuse to listen to the terms of capitulation which we suggested, alleging as the reason of their holding out that any extension of time or change of conditions of the programme of competition — the example of Toronto to the contrary notwithstanding — would be "manifestly unjust" to those architects who had already begun work on their designs. How offering more liberal terms, an increased number of prizes, and an extension of time can be an act of *injustice* to the "several hundred" architects who, we are told, have already written for particulars, and inferentially intend to compete, we are unable to discover. As we can hardly assume that our action has had the effect of hindering in his work any architect who had decided to compete, it may be presumptuous on our part to express the sincere hope that nothing we have said or done will tend to make the result to the City of Richmond any more unsatisfactory than the original conditions compel. We therefore ask our readers to refrain from sending in further contributions, and beg to inform those who have shown themselves liberal-minded and public spirited enough to support a scheme which was not advanced by us as in any way the best, or a panacea, that these contributions will be returned to them as speedily as possible, and with them our thanks.

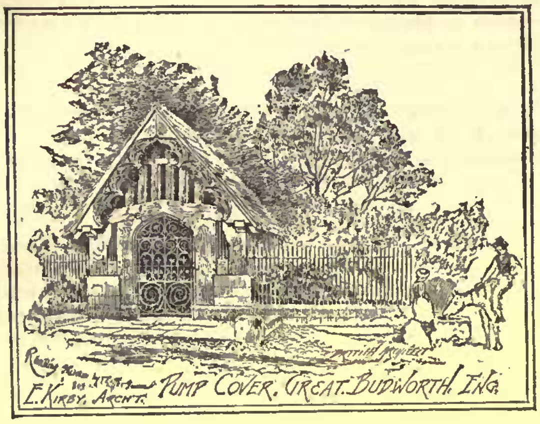
THE State Architectural Association of Minnesota has already made itself commendably prominent in affairs concerning the profession in that State, and will, we hope, find many opportunities for exercising the good sense and professional feeling which seems to characterize it. A law, which it has been instrumental in framing, is now before the State Legislature, to provide for the licensing of architects, and there is some prospect that it may pass, even in the short time now remaining before the close of the session. Another subject, which has recently been called officially to the attention of all the members of the Western Association of Architects and its affiliated societies, is the important one of the ownership of drawings. The profession has suffered altogether too long from the unjust precedent by means of which a malicious client can with impunity inflict severe loss upon an architect whom he takes a fancy to injure, and it is much to be hoped that the combined wisdom of the Western architects may discover some way out of the difficulty.

OUR readers may remember that a plan was formed a year or more ago for establishing telegraphic correspondence, by means of the "heliotrope," between the islands of Réunion and Mauritius in the Indian Ocean; and will be glad to learn of the complete success of the undertaking, although various mishaps prevented the establishment of the final telegraphic posts, until a few months ago. As we mentioned in our first notice of the scheme, the business interests of the two islands are closely connected, more than twenty thousand letters annually passing between them, but the main purpose in the mind of the benevolent and public-spirited originator of the scheme is said by *Le Génie Civil* to have been a provision of a means for warning the people of Réunion of the approach of cyclones. These are very frequent in winter, and terribly destructive, but as they always pass over or near the Mauritius coast from twenty-four to thirty-six hours before their arrival at Réunion, a telegraph of any kind, by putting the people of the latter island on their guard, might save much property every year, besides many lives. So important has this point long been considered that several attempts have been made to unite the two islands by submarine electric cables, but all have failed, the bed of the channel being very unfavorable to cable-laying, while the approach to Mauritius is such as to make the expense of connecting the land end of the cable very difficult.

THE credit of devising the scheme which was finally successful is due to M. Adam, a former naval officer, now practising at Mauritius as an expert before the foreign consuls in admiralty cases. Becoming convinced, from the accounts of the experiments successfully made for connecting the two shores of the Strait of Gibraltar, that similar communication was possible between the two islands, M. Adam, after studying the character and position of the signalling apparatus which would be necessary, published an account of his plan, and appealed to the public of Mauritius and Réunion for money to carry it out. A company was formed, and some influential scientific men in Paris having interested themselves in the undertaking, a grant was obtained from the French Government of two telescopes, with the necessary accompaniments, and M. Adam was sent to Paris to learn the use of them. On returning to Africa with his telescopes, he proceeded to establish his signalling stations, at the top of two mountains on the opposite coasts, about one hundred and twenty-five miles apart. The first post established was at Réunion, and as soon as the signalling mirror, which was only thirty-nine inches square was set up there, the reflected flashes of sunlight were observed without a telescope at Mauritius, under the appearance of a bright, orange-colored star on the horizon, the light being estimated at about two and one-half times that of Venus. This made it certain that signalling was possible, but the rays from the mirror reached Mauritius in a place where no station suitable for containing the telescope and other apparatus could be built; and even if a foundation could be secured, the path of the rays passed so near a bare peak that it was feared that the irregular refraction due to the currents of heated air passing over the rock, would interfere with observations; so it was decided to choose new stations on both islands.

THIS took time, as very accurate determinations of the horizon had to be made, in order to be sure of transmitting the feeble rays used in night signalling directly into the axis of the observing telescopes; and this, together with a misfortune in the shape of a cyclone, which demolished the station at Mauritius, and nearly ruined the apparatus placed in it, delayed the work for some months. The interval was spent in repairing the damage, and in some clever calculations for determining the exact line of sight with regard to the sun, through which M. Adam was able to send word from Mauritius to his partner at Réunion that if, on a certain day, when the apparatus would be again in position, he would direct his telescope at the centre of the sun, as it rose above the horizon, and fix it in that position, he would see through it later the reflection of the mirror at Mauritius. This ingenious piece of amateur applied astronomy was perfectly successful, but it was found that the great height of the station at Réunion above the sea interfered so seriously with continued observations that it was decided to find a lower one, and the apparatus was again moved. This was the last change, and on the twelfth of last July, the telescopes were finally pointed in exactly the required direction, and the interchange of messages began. Through the telescopes, the day signals, made by reflected sunlight, are of dazzling brilliancy, while the light of an ordinary petroleum lamp is sufficient for night work; but it is intended to use an electric light as soon as the prospects of the company will warrant the expense. It is worth noticing that the height of the signal-station at Réunion above the sea-level is only about two thousand feet, while that of the Mauritius station seems to be nearly the same; and if this height, as appears to be the case, serves perfectly for signalling at a distance of more than a hundred miles, it seems probable that the system might be extensively used in moderately mountainous countries. By careful selection of stations, for instance, there seems to be no reason why signals should not be sent in this way, by three or four steps, from Paris to Rome, and in our own country there would probably be a succession of peaks of sufficient height for the purpose, and spaced at about the necessary distances, from the centre of Maine, by way of the White Mountains, the Adirondacks and Catskills, the Hudson Highlands, and the various chains of the Blue Ridge, as far as the middle of Georgia.

THE ARCHITECT'S AND BUILDER'S POCKET-BOOK.[1]



TO those architects who have been accustomed to refer in all their difficulties to the invaluable Trautwine, the idea that any person should attempt to write a book to supersede Trautwine in their libraries will probably seem at first not only audacious, but in some degree profane, and the author of such a work must inevitably encounter the criticism which is visited upon all who appear to be desirous of insinuating themselves into the place of others better known than themselves. Yet, it is not too much to say that something like one-fourth of Trautwine's book is never so much as glanced at by architects, and much of the rest is expressed in a way which makes it of comparatively little use to them; and Mr. Kidder's attempt to collect by itself all the information contained in the ordinary engineers' hand-books which architects need to use, and to add much more matter which is very useful to architects, but not to engineers, is a perfectly legitimate one; to say nothing of the fact that Mr. Trautwine's book was first published about fifteen years ago, and that within this period new determinations of the resistance of materials have been made, which, although they alter the very foundations of the old rules for calculating the strength of structures, are in Mr. Kidder's book placed for the first time in available shape before those who will make the most use of them. We do not, as will be seen, consider the work beyond criticism, but we may begin by saying frankly that we never realized, until we read it, how much more useful engineering text-books might be made to architects by the adoption of familiar architectural forms and examples for their illustration; or how many things there were which architects, and not engineers, like to know and to refer to, which have never, before Mr. Kidder's book appeared, been collected in a form convenient for ready consultation and comparison.

Like Trautwine, Mr. Kidder's book begins with some elementary mathematics; a few explanations of signs and rules for extracting square and cube roots being given as the arithmetical portion, with the common tables of weights and measures, and methods for determining areas and volumes of different figures and solids, to represent mensuration, and thirty-eight very well selected geometrical problems. After these comes, what is not found in Trautwine, an excellent series of trigonometrical formulæ, taken from Searle's "*Field Engineering*," for the solution of oblique triangles as well as for general problems. Each division of this preliminary part is illustrated by copious tables; those of natural sines and cosines, tangents and cotangents, which accompany the trigonometrical portion, being, as it seems to us, more conveniently arranged than the corresponding ones in Trautwine, although only five places of decimals are given instead of Trautwine's seven. Of the tables of weights and measures we cannot speak with the same approbation, one or two of these being, to say the least, of mediocre interest to those for whom the book is designed, while others might with advantage be rendered more complete than they now are. We find, for instance, space occupied by a table giving the number of gallons in a puncheon of "Scotch whiskey," "of brandy," and other drinks, which might, we think, be better employed. If a puncheon of Scotch whiskey were a more definite quantity, we might be disposed to regard it, as a measure, with more consideration; but as, according to the table, it varies from one hundred and ten to one hundred and thirty gallons, in conformity, we suppose, with the moral character of the seller, we fail to see any reason for including it, or the similarly elastic measures of capacity for other alcoholic beverages, among the statistics which particularly concern the profession of architecture. Moreover, if the whiskey and rum table were left out, space would be gained for adding to the table of cubic measure, which comes just above it on the same page, some very important as well as interesting particulars. A "perch" of stone, for example, is given, with strict accuracy, as $24\frac{3}{4}$ cubic feet, and a note is added, mentioning that a "perch" in Philadelphia means 22 cubic feet, and that in some of the New England States it is taken at $16\frac{1}{2}$ cubic feet; but nothing whatever is said about the perch of 25 cubic feet, which is really the standard in all but exceptional cases, and, where there is likely to be any dispute as to local custom, is usually distinctly specified by architects. To this table might well be added also a definition of such very common measurements as the "square" of excavation, meaning six feet cube, or 216 cubic feet, the "rod" of brickwork, or 306 cubic feet, which, though strictly an English standard, is often used here by English workmen, and the "load" of sand, gravel or earth, which should be a cubic yard, but varies from 18 cubic feet, which is the usual seller's load, to 27, which is the buyer's standard. It would be worth while also to mention here the fact that stone is often sold by the cord, as well as by the perch, load, or cubic foot.

[1] *The Architect's and Builder's Pocket-Book* of Mensuration, Geometry, Geometrical Problems, Trigonometrical Formulas and Tables, Strength and Stability of Foundations, Walls, Buttresses, Piers, Arches, Posts, Ties, Beams, Girders, Trusses, Floors, Roofs, etc. By Frank Eugene Kidder, C. E. New York: John Wiley & Sons, 1885.

Most of the other tables are well chosen, and those giving the antique measures, although one would hardly expect to find them in an architect's pocket-book, will undoubtedly be found useful in those historical and archæological studies which most architects promise themselves the pleasure of some day taking up. The tables of the metric system might perhaps be made more convenient, and it is a mistake to give, as the expression for a thousand kilograms, only the word *tonneau*, instead of *tonne*, which is used far more frequently than its old-fashioned synonym.

The portion of the book devoted to geometry and mensuration, with the exception of an occasional inadvertence, like that on page 36, which defines the quadrilateral as a polygon of three sides, is excellent, and the diagrams are generally neatly drawn. We could have wished to see more attention given to the ellipse, a figure which architectural draughtsmen often have occasion to draw, and generally draw badly. Three methods are given for describing it; the first being a pretty one, common in French books, by which two concentric circles are drawn, with radii equal to half the longer and shorter axes of the ellipse, and radiating lines having been drawn through both circles, the points on the circumference of each cut by the radiating lines are connected by horizontal lines drawn from the points on the smaller circle, and vertical lines from the points on the larger circle, the intersections of these horizontal and vertical lines being points in the ellipse required. The other two methods given are those with the string, and two pins at the foci, and the straight-edge with points travelling on the two axes, both of which, though convenient for marking out a flower-bed, or an oval for a driveway, are quite unfitted for draughtsman's work, and should be supplemented by descriptions of the common method of striking intersecting arcs from the foci as centres, with any two segments of the longer diameter as radii, and of the mode of drawing normals to the curve, for convenience in laying out the joints of elliptical arches. After the ellipse, Mr. Kidder gives explanations and diagrams of the parabola and hyperbola, and, like Trautwine, completes his collection of curves by the cycloid, of which he gives a diagram, and a method of drawing the curve, a little carelessly described. For architects' use we should have been glad to have had the list extended by the addition of the beautiful "arbor arch," as the carpenters call it, described by dividing the longer and shorter sides of the rectangle circumscribed about it, with sides parallel to the major and minor axis, each into the same number of parts, and connecting the points of division, beginning with the one nearest the end of the major axis on the short side of the rectangle, and that farthest from the end of the minor axis on the long side of the rectangle, by straight lines, which will be tangent to the required curve. This arch is more easily drawn, and far more readily enlarged in scale, than either the ellipse or the cycloid; and deserves, both for its beauty and its strength, to be more generally used than it is.

With Part II begins a brief, though systematic explanation of the common modes of calculating stresses in arches, beams and frames, with tables of the resistances of all the principal materials used in architecture. To our mind, this is the most useful, as well as the most original portion of the book. Mr. Trautwine gives, indeed, much of the same sort of information, but it is scattered through the book, his directions for finding the line of pressure in an arch and its abutments, for instance, being distributed in four different articles, the first being separated by nearly a hundred and fifty pages from the one containing the conclusion; and his method for determining this, as well as other kinds of strain, is not, when ascertained, so comprehensible and modern as that which Mr. Kidder follows. There are, as will be seen, many points in which Mr. Kidder's chapters on the general subject of strength of materials and stability of structures stand much in need of revision; but, with all their imperfections, they present, both in matter and form, the most useful brief collection of rules and data yet available to young architects.

After a few pages of definitions and explanation of terms, the various problems of strength and stability of structures are taken up in the order in which they occur during the construction of a building. There is more virtue in this choice of sequence than may at first appear. To the mathematical mind the theory of composition and resolution of forces is a thing to be first studied by itself, and applied later to such problems as may be capable of being solved by it; but the busy young architect or builder has, or thinks he has, no time to master one or two hundred pages of theory before he can understand the rules bearing on the point of practice which immediately concerns him, and Mr. Kidder's method, of following the successive steps of actual building, and working out his rules at just the points where their application is necessary, will make his book invaluable to hundreds in whom the very name of applied mechanics has hitherto excited nothing but terror.

Like the structures to which it relates, Part II begins with Foundations, collecting a great deal of information, and many rules and examples, into a chapter which needs, for completing its excellence,

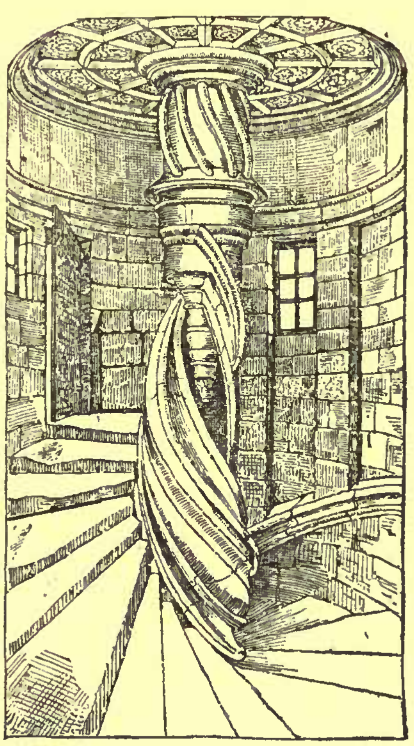
nothing but a little more careful revision. Not only do some minor slips need correction, such as the assignment of the Lock Ken viaduct to Bordeaux; the designation of "fir," a timber unknown in this country, as one of the materials appropriate for piles; or the quotation of Sanders's formula for pile-driving without specifying whether the "sinking at the last blow" in the denominator is to be measured in inches or by some other standard; but there are some items of practical information which are, to say the least, questionable; such as the paragraph which treats of "Foundations on Compact Stony Earths, such as Gravel or Sand," in which it is stated that in soils of this kind drains should be made "at the bottom" of the trenches "to carry away the water;" a proceeding which would be very likely to result in undermining the wall in anything like a sandy soil; or the closing suggestion in regard to pile foundations, in which, after quoting Sanders's rule, the author remarks that "in ordinary pile-driving for buildings, . . . as the piles are seldom loaded to their full capacity, it is not necessary to be so particular as in the foundations of engineering structures." It would be interesting to know what difference Mr. Kidder finds between "a building" and "an engineering structure" in regard either to the pressure which they exert on their foundations, or the propriety of making sure, by suitable calculations, that neither of them will fall down. There is no point of building which is more shamefully neglected by contractors and cheap architects than that of securing safe pile foundations in "made" land; and Mr. Kidder should have hesitated long before encouraging a carelessness which is bearing bitter fruit in many of our maritime cities, by lending his authority to the notion that "it is not necessary to be particular" in regard to such matters. We are sorry to find, later, that this dangerous maxim is further supported by Mr. Kidder's table, "showing the permissible loads on various kinds of foundation beds, per square foot," in which rules are laid down which are anything but "particular." Passing over the standards given for gravel and clay, which err rather on the safe side, we find the safe load for "piles in artificial soil" given at four thousand pounds each; while "piles in firm soil" are allowed "thirty thousand to one hundred and forty thousand pounds each." What would be the proper load for piles driven through "artificial soil" to a stratum of "firm soil," which is the ordinary state of things in city pile-driving, we are not informed; but the worthlessness, or worse, of all such rules may be illustrated by an experience of our own, in which, on driving a large number of piles for a certain building, a cluster of them, reaching, probably, some fault in the supporting stratum, showed, by Sanders's formula, a resisting capacity of two tons each, while nearly all those around the spot, and for a considerable distance beyond, brought up with a sinking which indicated a resistance of eight to nine tons. In such cases as these, which are common enough in districts of made land, the application of Mr. Kidder's easy-going rules would lead infallibly either to the placing of a dangerous load on the piles in the soft spot, or, by the adoption of a standard of loading adapted to these, to the driving, for the rest of the building, of more than four times as many piles as there was any need of.

Having made these criticisms, we can with a clear conscience praise the remainder of the chapter, and go on to the next, pausing only for a moment to notice some illustrations of foundations for high chimneys, models of their kind, which Mr. Kidder copies, giving, as he supposes, proper credit for them, from "the latter part of a work by Mr. George T. Powell." We had once the pleasure of reviewing the work referred to, in which, as we were grieved to find, Mr. Powell's part was that of a somewhat surreptitious compiler of other people's ideas; and the entire portion of his book containing the diagrams and descriptions of chimney foundations is simply a judicious appropriation of a little work published some years ago in Chicago by that excellent architect, engineer and citizen, Mr. Frederick Baumann, to whom, and not to Mr. Powell, the credit for the chimney designs should be given.

We need not enter minutely into the half-dozen chapters succeeding this. In brief, they contain the simple methods of modern applied mechanics for determining the strength and stability of piers and buttresses, arches, iron tie-rods, rivets and eye-bars, wooden and iron columns, beams of iron or timber, and trusses and frames of all ordinary kinds in wood and metal. Our readers know already our high opinion of the merits of this portion, and our only regret is that a little carelessness in the proof-reading should here and there have obscured the clearness of the diagrams and explanations. In one or two cases, for instance, the letters in the diagram do not agree with those in the text intended to refer to them; in the chapter on arches the plates for the diagrams are tilted out of place, so that lines described as horizontal or vertical make a very appreciable angle with their proper directions; and errors in punctuation, or little slips in the choice of a word, sometimes make it difficult at a glance to understand the meaning of the author's sentences; while, as we think, a rather too liberal construction of the ordinary rules is occasionally suggested. It is to be remembered that the persons who will use books of this kind are constantly tempted to overstep the bounds of perfect safety in the application of the methods which they find given; and if they find the author stating on one page that in order "that an arch shall be stable, it is considered necessary that it shall be possible to draw a line of resistance of the arch within the middle third," and on the next page, after calculating a line of resistance which does not lie within the middle third of the arch tested, dismissing the subject with the easy comment that "If it" (the line of resistance) "had gone outside the middle third to a very great extent, we should have considered the arch unstable," they will be likely, if severely tempted, to improve considerably on Mr. Kidder's idea of what constitutes a serious "extent," and to design arches, perhaps of the most perilous construction, in strict accordance, as they imagine, with the rules which Mr. Kidder intended to prevent such practices. It is true that, with an arch well cemented together, a slight deviation of the most favorable pressure curve beyond the limits of the middle third may not be immediately followed by the crushing of the stones where the curve approaches nearest the intrados or extrados, or the opening of the outer portion of the joints; but time, and the changes in the mortar, or the masonry, may give the destructive forces full play, and in any case it should be remembered that the pressure on the joints of an arch is divided equally by the curve of resistance, and that if this approaches too near either to the extrados or intrados, one-half of the total pressure may easily be concentrated upon so small an area as to compress the stone far beyond its strength.

It would take much too long to mention even half the points in which we think some slight improvements might be made in the book, but most of them will occur to nearly all its readers, and as corrections or changes can readily be made in subsequent editions, it would be ungracious to dwell long upon the inevitable oversights of the first edition of a book which, as a whole, admirably fulfils its purpose of becoming an indispensable companion in the work of every architect, young or old.

THE *CITÉS OUVRIÈRES* OF MULHAUSEN.



Staircase · Tours · Cathl. France

MULHAUSEN is a busy manufacturing town located in the southern part of Alsace, a few miles from the Rhine. It has a population of about 70,000, and with the adjoining towns of Dornach and Napoleonsinsel, forms the centre of very extensive milling and paper industries. The various factories give employment to a vast number of hands, and as long ago as 1836, the question of the proper housing of the laborers began to assume an importance, which called for some public action. Any one who has visited a Franco-German manufacturing town, can appreciate how Mulhausen might have appeared fifty years ago. Considerable was done by the city in the way of enactments and tenement-house regulations, but finally a society was organized chiefly through the efforts of M. Jean Dollfus, one of the heaviest manufacturers, which had for its object to provide suitable homes for the poorer classes. The work and methods of this society have stood the test of thirty years, during which time the country has passed through two wars, and has finally even changed ownership, owing to the consequences of the Franco-Prussian struggle. A study of the results achieved cannot fail to be of value to every one interested in economical building or social reform.

First, as to the society itself. In a measure only is it a benevolent institution. That is to say, it does not primarily undertake to provide lodgings, but simply builds houses such as in its judgment seem best adapted to the wants of the people, and sells them at a price sufficient to cover the cost of erection, including transfers, insurance and interest during the time allowed for payment, retaining what is virtually a mortgage on the property until the whole, including the land, is finally paid for. If buyers should not present themselves as the houses are completed, they are let at a rent amounting to eight per cent of the total cost, though the terms of sale are so reasonable that the mechanics generally prefer to buy. The society was founded in 1853, under the name of *La Société mulhousienne des Cités ouvrières.* The capital stock subscribed amounted to 300,000 francs, subsequently raised to 350,000 francs. Beyond this the State voted a subvention of 300,000 francs, which was entirely devoted to meeting the expenses of new streets, sidewalks, sewers and other works of a public nature, in order that as far as possible the individual purchasers need pay for no more than the cost of the building and the land. The principal source of direct revenue has been the renting of unsold

houses, the money so derived going to pay interest at four per cent on the capital stock, and meet expenses of appointments, salaries, etc., any surplus being devoted to works of a general public character. As the tenants are charged five per cent interest during the period of payment, an additional one per cent surplus is also made available for extensions of the work. In order that the long terms of payment should not interfere with the progress of the building operations, the society borrowed on its property some 300,000 francs, which sum was easily obtained at four per cent interest.

For the location a large tract of level land was selected lying between Mulhausen and Dornach, the cost being from seventy centimes to one franc per square metre. Several streets were laid out, and everything seems to have been done very systematically from the start, so that as far as the *Cités* are concerned, there has been little cause to regret past arrangements. Previous to the actual organization of the society, M. Dollfus had made some experiments in Dornach with a view to determine what manner of house would best suit the needs of the working people. Four houses were erected, and after having been in use for some time, the tenants were questioned, and careful notes taken of all practical points, two different types being finally adopted which served as models for the buildings erected by the society. It is doubtful if either of these types would specially commend themselves to American investors, but the result has shown them to be quite satisfactory to the average Alsatian workman.

The houses are sold under the following conditions. A first payment is made of 250 to 300 francs, according to the value of the property. This amount is placed to the credit of the purchaser, and serves to cover any expense of taxes or legal fees when the contract is finally delivered. Interest at five per cent is reciprocally charged, and allowed on the total cost, and on the monthly payments in exactly the same manner as in the case of partial payments on a note of hand, though the interest on the payments is computed monthly while the interest on the principal is estimated only on the amount remaining due at the end of the year, a slight advantage thus being allowed the purchaser. The payments are made at the rate of twenty-five francs per month for a house costing 3,000 francs. This amount is no more than would be asked in the town for the simple rent of a much smaller apartment, while it is only slightly in advance of what the society would ask for hire of the same premises, since the interest on the money is but five per cent, while the rent amounts to seven. As an example of how this would work we will suppose a house costing 3,000 francs. The first year the payments amounts to 600 francs; for the next twelve years they are 300 francs per year, so that in thirteen years and five months the buyer will have paid in all 4,326.80 francs. Had he rented the same house at eighteen francs per month he would have paid for the same length of time, 2,873 francs; consequently the purchase of the house has necessitated an extra saving of only 1,453.80 francs, or about one hundred francs per year. If after a number of payments have been made the buyer for any sufficient reason decides not to purchase the property, the society allows him to withdraw, charging him rent for the time the house has been occupied, and refunding the difference between that amount and the total of his payments, plus interest on the first payment of 300 francs.

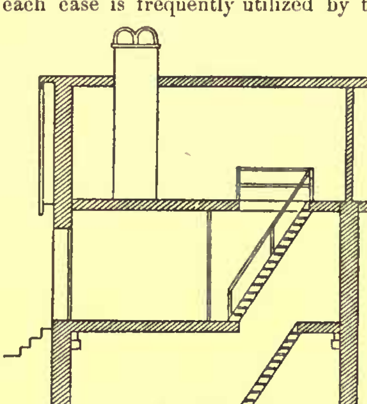
In order to prevent outside speculators from buying up a number of the houses, and selling them to the detriment of the class for whose good the society was organized, the houses are sold only on condition that the purchasers shall not sell out inside of ten years; nor sub-let any part of the property without special authorization from the council of administration. At the same time a transfer of the house to another *bona fide* workman is always allowed, and if a family has spare rooms and desires to increase its income by taking in lodgers, no objection is made thereto, as the manifest object is to pay for the property in a shorter time. Indeed it has been found that in proportion as the balance due becomes diminished, the tenants become less willing to sub-let their rooms. The society also reserves certain rights of enforcing repairs, and a due regard for cleanliness during the ten years after sale. The tenants may by special permission make any desirable additions to the houses without infringing on adjoining property, and in looking over the colony it is remarked that many of the houses have been enlarged in some way, either by dormers or Ls. The shade and fruit trees and the enclosures must be maintained by the proprietor, who must keep the garden in a good state of culture. In case the monthly payments are not made with sufficient promptness, the society takes possession of the property, charging the tenant rent at eight per cent for the time it has been occupied, and reselling at its discretion.

The society has not confined itself to building houses for sale only. As no stock dividends are allowed, there is every year a surplus from the rents, etc., which allows of some enterprises not originally contemplated. Thus a large house has been built, divided into rooms simply furnished, which are rented at the low price of six francs per month to single men. The society, together with the city, has also built a *salle d'asile* for 250 children, and has given two houses, rent free, for a Sister of Mercy and a doctor to care for the sick. A fine church has been erected, though not directly by the society. There has further been provided for the use of the inhabitants of the *Cités ouvrières*, who now number more than 7,000, a bakery where bread is sold at cost to the amount of from six to seven thousand francs per month. There is also a restaurant, very plain and simple in its appointments, but where good, well-cooked food can be had at a very cheap price, a dinner with bread, soup, boiled beef, and two kinds of vegetables, costing only sixty-five centimes. Adjoining the restaurant is a well-stocked circulating-library in both French and German. The society has also constructed a number of bath-houses where nearly 10,000 people bathe themselves annually at a cost of fifteen centimes per bath. There are also several laundries which have proved a great help to the people. They are supplied with an abundance of hot water derived from the condensers of the steam-engines in the adjoining factories, and have accommodation in all for about 350 washers at a time: 40,000 lots of clothes are washed here per year. The cost is but five centimes for two hour's use. These laundries are in part provided with drying-rooms and centrifugal wringers, for the use of which an extra charge is made.

Besides all this, the society has endeavored to further lessen the expenses of the people by selling at cost many articles of prime necessity, such as potatoes, oil, coke, stoves, etc. It has sold over 700 oil-stoves, and in three or four years has disposed of more than 6,000 ready-made coats at a price of 6 francs 50 centimes each.

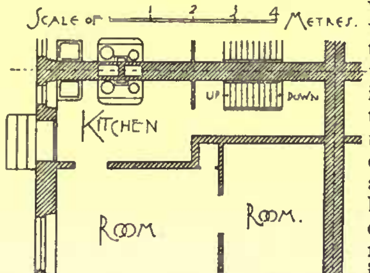
The work of the society has had a very marked effect on the towns adjacent in the way of making possible a better class of buildings for the poor. Mulhausen has grown very rapidly in population during the past quarter of a century, and the new structures erected for the working classes between the *Cités ouvrières* and the town proper have in general followed the system adopted by the society, with prices lower than would otherwise have prevailed; while landlords of the crowded buildings in town have been obliged to make constant improvements in the accommodations they offer, in order to keep their tenants from migrating to the newer and more spacious suburb.

The buildings of the society are of three descriptions: First, those in blocks of ten, eighteen and twenty, the houses in two stories, back to back and side to side; an arrangement permitting of such limited provisions for light and ventilation that it was seldom used. Second, houses in rows; open at front and back; which was an improvement in arrangement, but not the best, besides having been built on a larger scale than is now called for. Third, houses in groups of four, which scheme has been finally accepted as the most successful, and is invariably followed in present constructions. A plan showing a quarter of one such block is given herewith, and the sketches will afford an idea of the exterior disposition. The house shown in plan is but one-story high, which is the kind commanding the readiest sale, and of which the greatest number have been erected. In the two-story houses the upper part is divided into three chambers, and the loft in each case is frequently utilized by the tenants as extra space for rooms, dormers being often added. As delivered by the society, the four houses or tenements are covered by a single unbroken roof in common. Each house has a good, dry cellar under the whole. In the main story, the entrance to the house is through the kitchen, an arrangement possibly intended to encourage neatness on the part of the occupants. Opening from the kitchen is the living-room, and beyond that a small bedroom. Stairs go up and down at the rear of the kitchen. The construction is substantial and good throughout, the exterior walls being of rubble stonework covered with stucco, and the partitions of brick. At the base of the outside walls is laid a course of asphalt fifteen mm. thick, to prevent moisture from rising. The ceiling of the cellar is lathed, and the space between the beams filled with plaster and cinders to keep out any dampness. The kitchen is paved in brick; elsewhere the floors are of plank. The first floor is 0.80 m. above grade level; the cellar 1.80 m. high in clear, and the main story 2.70 m. The roof is covered with tiles.



SECTION

SCALE OF 1 2 3 4 METRES.



FIRST FLOOR.

For the sanitary arrangements the kitchen waste and the water from the roof are led directly to the open street gutters, and thence to the sewers. There is no gas or running water in any of the houses, but hydrants are located on the streets at convenient intervals. A privy is attached to each house, one cesspool of a capacity of one-and-a-half cubic metres answering for two families. The cesspools are built of masonry, tightly cemented inside, and are emptied regularly by the city authorities.

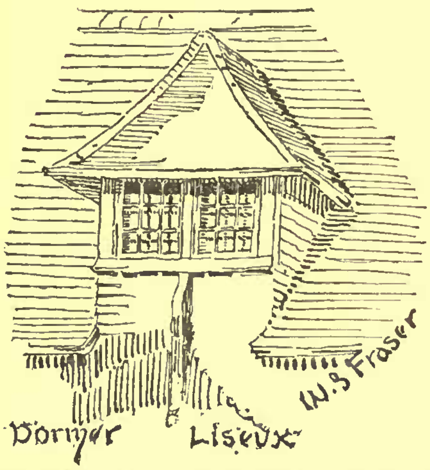
Among so many workingmen one must expect to find families which will be dirty and disorderly, and many houses which are badly taken care of; but a visit to the *Cités ouvrières* is most gratifying as showing how much the society has done not only towards providing good, comfortable homes for its *protégés*, but also towards educating

them to properly care for themselves. Each house has a garden all around it, and in the streets, the society has planted rows of trees, so that in spite of occasional dilapidations the *Cités* as a whole present a very good aspect. In many cases by reason of additions and alterations the houses have assumed quite a picturesque appearance, and while none of them have the slightest pretensions to architectural effect, they can be made to look neat and homelike, and it is evident that the owners take a pride in them. One of the best achievements of the society has consisted in teaching the workmen to take care of themselves, and to economize by small monthly savings.

In order to meet different wants, some of the houses have been made smaller than is shown on the plan. but it has been found that those which are not more than 5.25 m. by 5 m. are best suited to the desires of the people. A house of this description, one-story high, is sold at a price of 3,000 francs. A house with two stories costs 1000 francs more. The land, of which there are 228 square metres to each family, costs about 200 francs. According to the report of the society for 1881, there had been erected in all to that date 996 houses at a total cost of 2,957,875 francs, all of which had been sold at a price of 2,932,475 francs. The payments on the houses had amounted to 3,845,734 francs, 95 centimes, a sum of 517,017 francs, 65 centimes remaining due. Since 1881 forty-four houses have been erected. The value of the property has greatly increased since the society first began to build, so that now its operations can be said to have amounted to a total, in round numbers, of four million francs.

C. H. Blackall.

CEMENTS.



After a lengthy practical investigation upon the subject of hydraulic cement, during which time I tried to deal knowingly with the phenomena of hydraulics, I succeeded in deducing an abstract formula, which will, no doubt, throw light upon the allotropic conditions or stages of hydraulic cement. This formula shows, first the proper composition of the raw material or rock, then the rock after calcination, and again the cement (as an impalpable powder) after hydration, which is generally performed at the place of use. The formula is as follows: —

(1) Before Calcination. — Rock.

$$9\ Ca\ CO_3 + 3\ Si\ O_2 = \text{Cement Rock.}$$
$$74.85 + 15.15 = 100 \text{ per cent.}$$

(2) After Calcination. — Cement.

$$5\ Ca\ O + 3\ Si\ O_2 = \text{Cement (ground).}$$
$$62.50 + 37.50 = 100 \text{ per cent.}$$

(3) Cement after hydration. — Rock.

$$5\ Ca\ O + 3\ Si\ O_2 + 5\ H_2\ O = \text{Rock.}$$
$$38.46 + 25.08 + 38.46 = 100 \text{ per cent.}$$

Again, I would state that if a rock varies from the per cent of carbonaceous and argillaceous matter indicated in stage No. (1) in the formula, it either becomes a fat lime by an excess of the lime constituent, and a consequent decrease in the argillaceous factor, or on the other hand it approaches in composition and character a Roman cement or puzzalano, which is always inferior in bonding properties, to a cement resulting from a rock which comes under the proportions indicated in the first stage of the formula.

It will be readily seen by an observing mind, that by the loss of carbonic acid gas (a constituent of all carbonates) during the calcination of the rock, the limits in composition for the best hydraulic cement cannot vary from the figures stated in the second stage of the formula. Now we have succeeded in converting a rock of the proper proportions into an anhydrous silicate of lime and alumina, which only requires the admixture of water to convert into a hydrous silicate of lime and alumina, in which state it is much more dense and hard than the rock from which it was made. To prove my foregoing statements, I will give the approximate analysis of various foreign and domestic Portland cements, which are acknowledged to be the best upon the market.

White's English Portland, sixty-three lime base to thirty-seven acid radical.

Dyckerhoff & Son's, manufactured at Bingen-on-the-Rhine, sixty two lime base to thirty-eight acid radical.

Saylor's (American) Portland, sixty-four lime base to thirty-six acid radical.

As these are the standard cements now in use, and all seem to give entire satisfaction, it will be perceived that they do not vary much in composition from the second stage of the formula, though they are produced at points far distant from each other. Of course the proper composition of a cement rock indicates to the manufacturer the elements of success, while it does not insure it, for a producer may have all the raw material of the proper composition that could be imagined, and yet for want of scientific knowledge in the manner of manipulation, he will utterly fail in giving to the consumer the article desired. Unfortunately, Nature neglected to make a Portland-cement rock of the exact composition and structure that it would require only calcination to fit it for the market, or in other words, the same process in manufacture that our domestic cements receive. Now should a prospector be so successful as to discover a pocket of calcareous rock, which by analysis would give the desired proportions for the production of a Portland cement, and should endeavor to manufacture by the process employed by all the producers of the United States, he would encounter entire failure, because of the wide difference in the structure of his raw material. Those who have examined carefully a cement rock with the naked eye have no doubt noticed that it is made up in the plan of a foliated structure; one lamina may be pure calcite ($Ca.CO_3$), which can easily be detected by its characteristic form of crystalization, while immediately under or above it you will perceive a corresponding lamina of pure silica (SiO_2). Now it is evident that the structure of a rock of this kind is such that the lime cannot unite with the silica during calcination, hence the desired chemical union can under no circumstances be formed, and the product will be an inferior cement, too quick in bonding properties for general use, though the composition for a true Portland existed. For this reason, if the material intended for the production of a Portland cement be of a natural formation, it will require a reduction to an impalpable powder, a tempering with water, and a thorough "mix," so that the constituents of the mass may be in intimate contact, and therefore when the process of calcination is performed, the desired union or formation of a silicate will take place. Not only is the "mix" important, but the burning of a Portland cement can in no manner be neglected; it must be performed with the greatest care, first, dehydration, then the expulsion of carbonic acid gas, and immediately after this has been accomplished a constant white heat is required for the chemical union of the carbonaceous and argillaceous constituents, which is kept up until surface vitrification takes place, when it can be presumed that the desired result has been effected; that in other words, an amorphous silicate of lime and alumina has been obtained. Again, if the white heat is kept up too long, the product will be what I would term an impure glass, which if reduced to a powder will exhibit no bonding properties, or at least, if any union takes place it will be extremely feeble. It will be readily perceived that the manufacture of a Portland cement requires a certain scientific knowledge of the constituents with which a producer has to deal. Where is the man who can say, you have such and such per cent of this element, and so much of the other? for many terrenes, though alike in structure and appearance are widely different in composition; for this reason alone it is highly important for those who undertake the manufacture of Portland cement from the natural raw material of this country to be capable of quickly ascertaining the exact composition of the material from any locality of the quarry. Unless there is a head of this kind in the management of a cement manufactory, success is most likely to be wanting, for uniformity in production is the only thing that will insure compensating returns. I would here suggest to men of capital that we Americans have the material for the production of Portland cement, and should be supplying our own demand.

R. W. B.

Washington, D. C., January 29, 1885.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

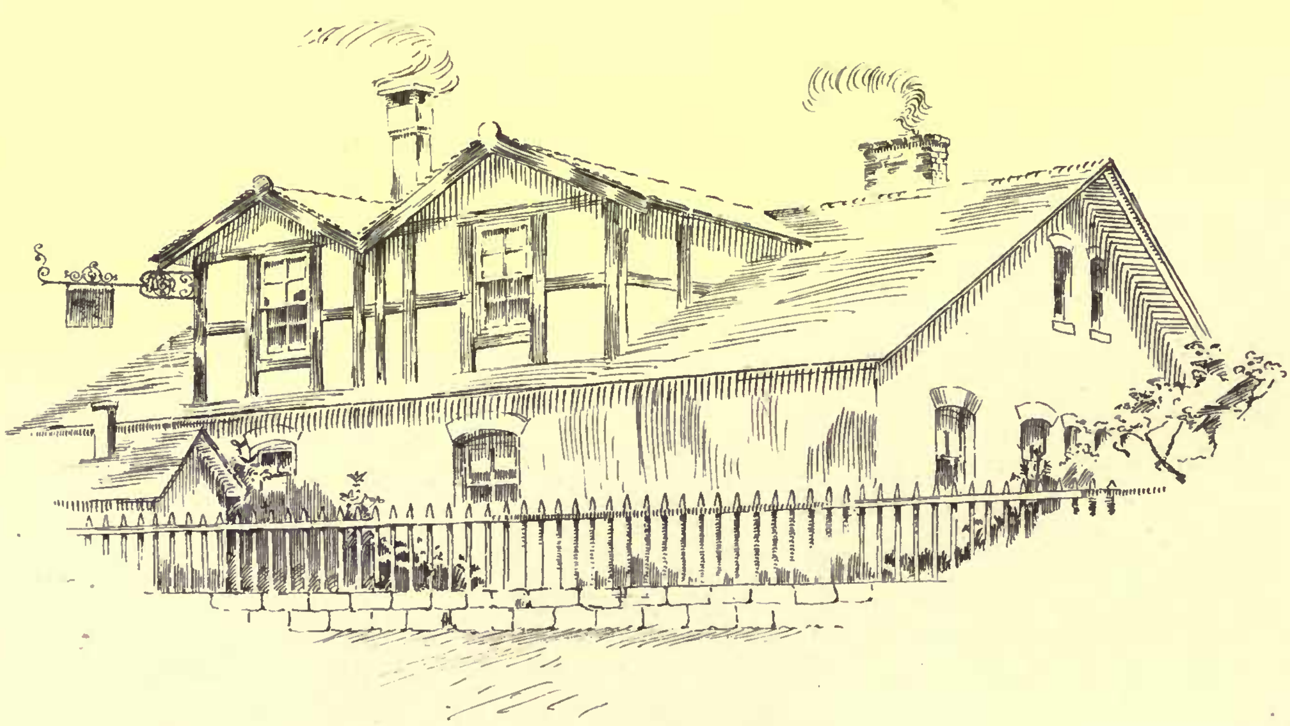
UNION DEPOT FOR THE CONCORD R.R., CONCORD, N. H. MR. B. L. GILBERT, ARCHITECT, NEW YORK, N. Y.

The drawing shows the head-house built of brick and rock-faced granite, and relieved with some touches of terra-cotta, and measuring 60′ x 218′: the train-house at the rear is to be of iron, and will measure 105′ x 770′. The pitch of the roofs is exceptionally steep, and the eaves are overhanging and well weathered, not a gutter having been provided; but to prevent danger or discomfort, a strong, iron frame awning projects over the sidewalk on three sides, the train-shed protecting the east side. The building is divided at the centre by a large, open rotunda into two wings, the entire ground floor being utilized for passenger and train service. Above the ground floor, the south wing will be occupied by the officers and offices of the Concord Railroad Company, and the north wing by the Northern and Concord & Claremont (N. H.) Railroad Company offices, etc. The central rotunda is about sixty feet square by over sixty feet in height, open to the roof, and showing the construction of the walls and open trusses. The floor will be of tiles or marble slabs, laid over brick arches, solid and permanent. At the west or street side, wide iron stairways lead to a wide gallery, extending around three sides of the rotunda, about seventeen feet above the floor line. On the east end under the gallery are placed wide doors opening into the train-shed, and a large, open fireplace with a front of rock-faced, dark red stone, and a shelving top, bevelled back. Over the gallery (covering a space of about

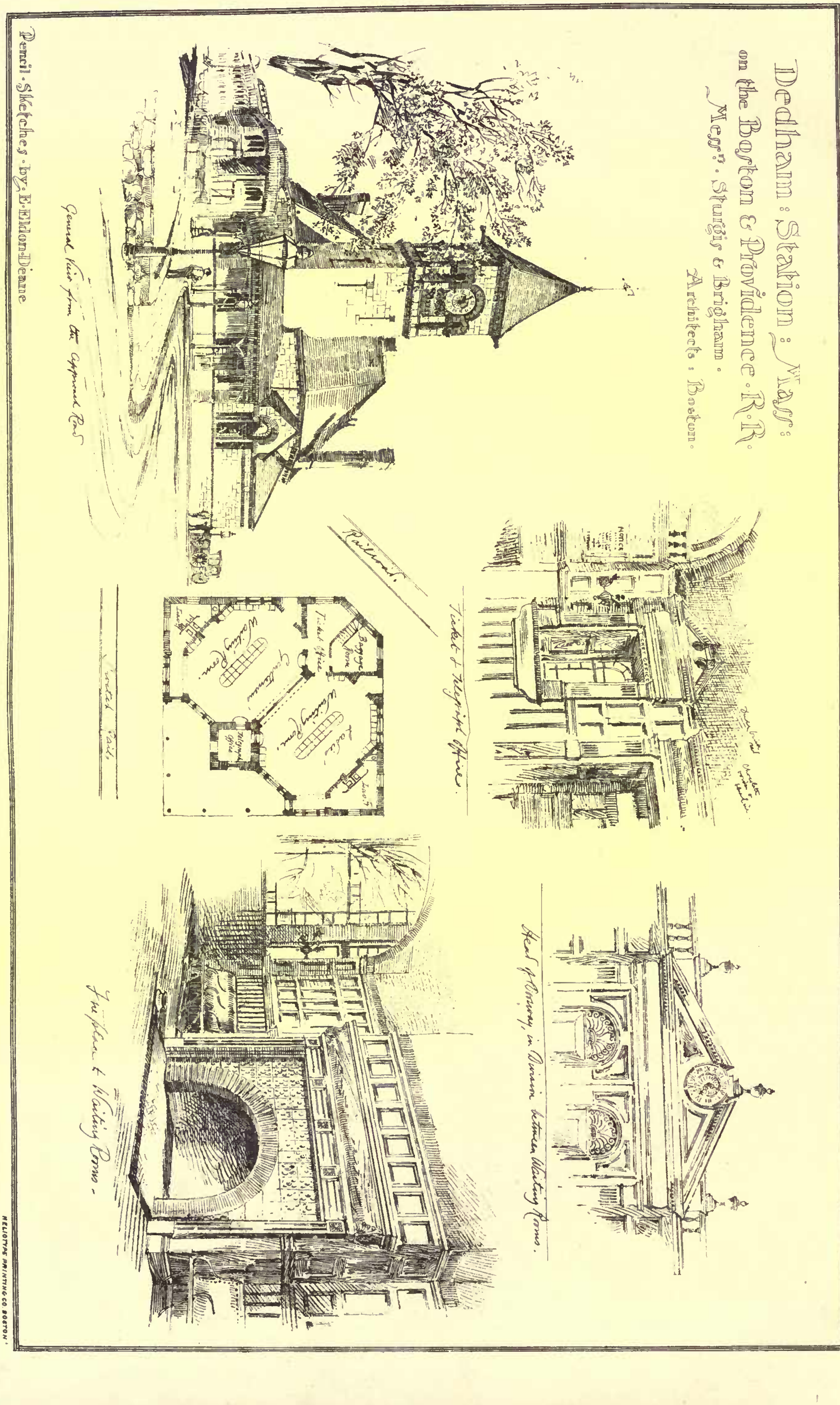


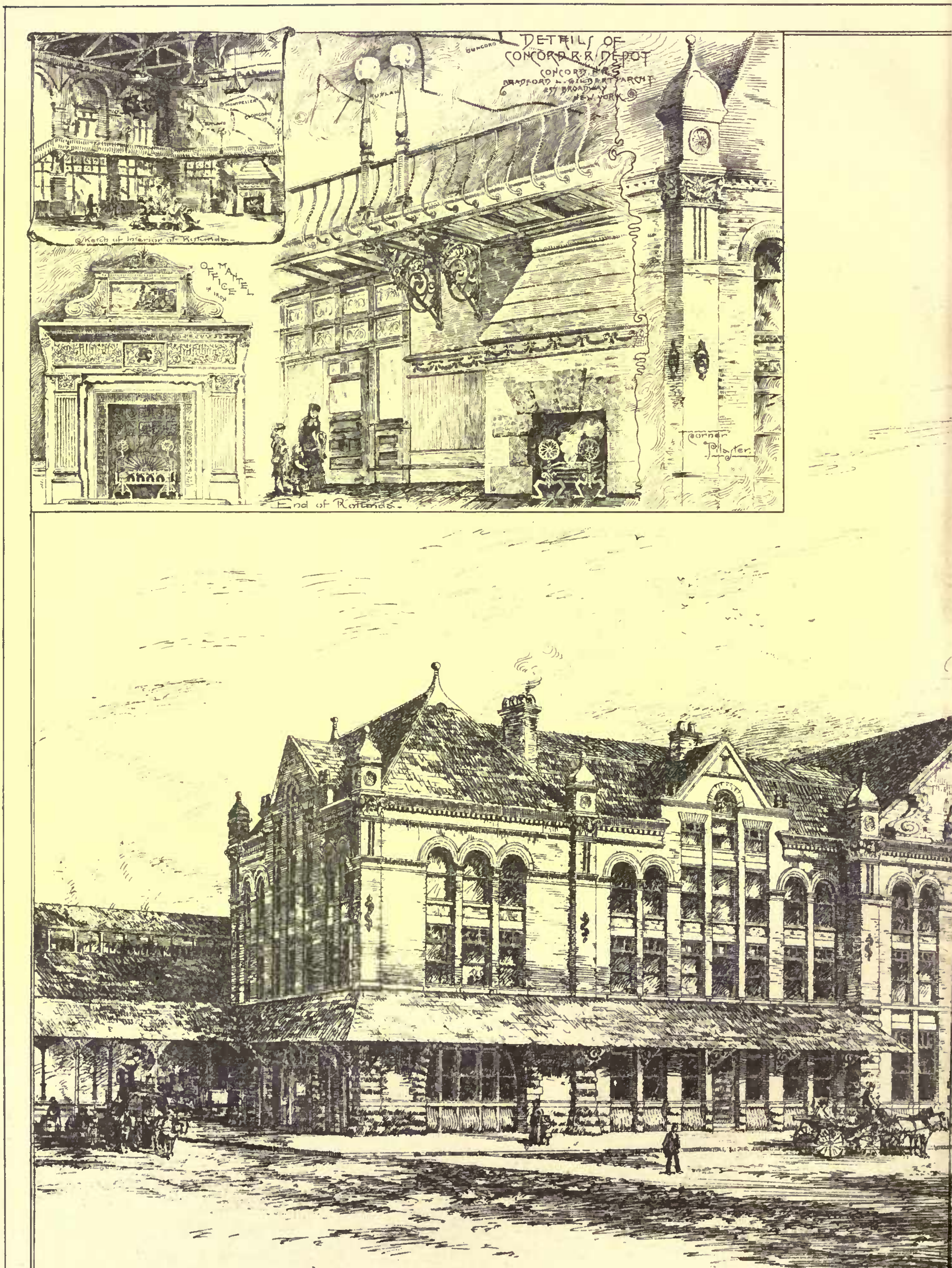
Workingmens' Cottages in the Cités Ouvrieres ~
~ Mülhausen ~ Alsace ~

Sketched by C.H. Blackall ~



HELIOTYPE PRINTING CO. BOSTON


Dedham : Station : Mass :
on the Boston & Providence · R · R ·
Messrs. Sturgis & Brigham ·
Architects : Boston ·
Pencil · Sketches · by · E · Eldon · Deane
General View from the Approach Road
Railroad
Ticket & Telegraph Office
Waiting Room
Ticket Office
Baggage Room
Waiting Room
Telegraph Office
Fireplace & Waiting Room
Head of Doorway, in Division between Waiting Rooms.
HELIOTYPE PRINTING CO BOSTON



UNION DEPOT AND OFFICE BUILDING FOR THE CONCORD

.OSGOOD & CO



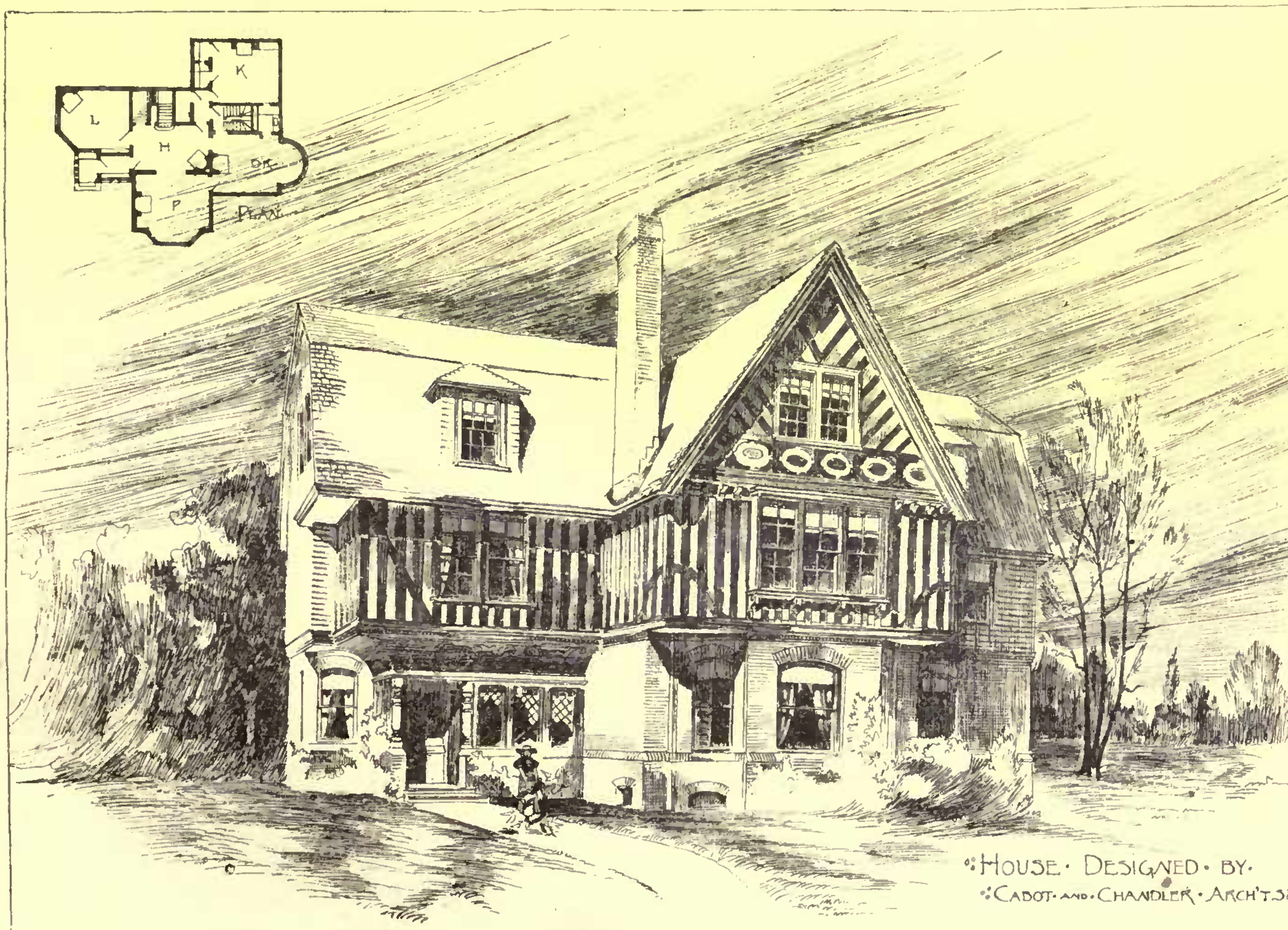
R.CO., CONCORD, N.H. B.L. GILBERT, ARCHT. NEW YORK CITY.

HELIOTYPE PRINTING CO. BOSTON



Stable at Cambridge, Mass.

Cabot and Chandler, Architects.



HOUSE · DESIGNED · BY ·
CABOT · AND · CHANDLER · ARCH'TS ·

HELIOTYPE PRINTING CO. BOSTON

American Architect and Building News, Apr. 4 1885 No. 484



Designs for Stained Glass,



by J. & R. Lamb.



HELIOTYPE PRINTING CO BOSTON

60′ x 40′), is a map in outline of the Concord Railroad and connecting lines. The roof trusses, exposed to view, are of oak, and a special system of ventilation has been provided in the upper ceiling. The finish of the walls is in rough stucco plastering. On all floors, open fireplaces, wash-basins, radiators, electric-bells, speaking-tubes, and all improvements are provided, as well as thorough sanitary plumbing. North of the rotunda, on the ground floor, is provided the restaurant, with kitchen and pantries complete; also, the Boston, Concord & Montreal Railroad office, and a conductors' room. At the extreme north end are telegraph and express office facilities, and a large fire-proof storage vault. On the first story in each wing are the general offices. In the second and third stories ample space is arranged for the freight office, clerks, engineers' offices, etc.

HOUSE AND STABLE, CAMBRIDGE, MASS. MESSRS. CABOT & CHANDLER, ARCHITECTS, BOSTON, MASS.

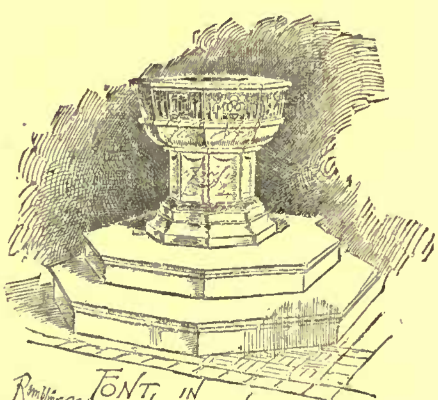
WORKMEN'S COTTAGES, MULHAUSEN, ALSACE, GERMANY. SKETCHED BY MR. C. H. BLACKALL.

For descriptions see article elsewhere in this issue.

RAILROAD STATION, DEDHAM, MASS. MESSRS. STURGIS & BRIGHAM, ARCHITECTS, BOSTON, MASS.

DESIGNS FOR STAINED-GLASS WINDOWS, BY MESSRS. J. & R. LAMB, NEW YORK, N. Y.

FARM BUILDINGS.[1]



THE first point to consider in fixing the site of almost any building in a country district is the water-supply, and for farming purposes it is most important that a plentiful supply should be obtainable close at hand. In theory, also, it is best that the buildings should be as nearly as possible in the centre of the holding; but in practice I find that the farmers as a rule prefer to have their houses and home buildings as near to a village as they can be got. On any holding above four hundred acres, then, the stock-yards, etc., should at any rate be on the farm itself, and a foreman's cottage should be close at hand. The position of the main roads must be carefully studied, and the easiest access to railway stations considered, the cost of transport being one of the largest items of expenditure in outlying districts. Having satisfactorily settled the site, the next point to consider is, whether there shall be one, two, or more stock-yards. For holdings up to five hundred acres, two yards will as a rule suffice; but it is best, if the funds at the architect's disposal will allow of it, always to give two, and as far as possible to separate the yards thoroughly.

Having arranged the yards, the next point to take into consideration is the aspect; and it is most essential to place the buildings so in relation to the crew-yards that the stock fattening shall get the benefit of all the sun that can be obtained, and also should be sheltered from the cold winds by the buildings. The buildings should, therefore, be on the northern and eastern sides of the yards, and the sides to the south and west left open. The level of the yard should be about two feet below the level of the stable pavement, and should be made as impervious as possible by well ramming and clay puddling so as to keep the straw bedding, etc., in the yard as "good" as possible. In the yards provision should be made for drinking-water for the stock, and if this can be running water so much the better; for an overflow pipe to keep the yard sufficiently drained is a necessity. In disposing the various buildings round the yards, it is best to place the following within easy distance of the farmer's house or bailiff's cottage; the nag-stable, gig-house, and harness-room, the calf-house, and the infirmary box. The first for convenience by day, and the latter by night, as occasion may rise, when it will be important to watch a cow or mare, or to feed the calves by hand, and a dry way of access to them is a good thing. It is a fault on the right side to make both the gig-house and the harness-room larger than the uses indicated by their names would imply. As the gig-house becomes generally a storage place for all sorts of odds and ends, from a sack of potatoes to empty bottles; and in the harness-room the odd boy about the place cleans the boots, oils the gun, and reads the local weekly paper on Sunday afternoon. About eighteen feet by fourteen feet is a good average size for the gig-house, and about half that size for the harness-room. A small loft is usually arranged over, in which a small supply of corn is kept, along with apples. Taking the buildings in rotation, we next come to the calf-house, which in an ordinary way, is simply a large box, about eighteen feet square, with a low manger on three sides divided up by wooden palings into pens of about six feet square. In larger buildings it will sometimes form a detached building with, perhaps, a tramway running down the centre for convenience of feeding, with the pens on each side, and a gangway all around of about four feet. With this arrangement the floor is sometimes sunk about two feet six inches, and I have seen a very simple and ingenious contrivance for altering the height of the manger daily as the bedding gradually becomes raised, so that the calves can get at their food without difficulty, but an ordinary iron trough answers all practical purposes. The internal temperature of the calf-house should be kept as even as possible, and it is better to build them with hollow walls.

I need not add that no loft for hay or any other fodder should be placed over any cow-shed or similar building, as the hay is not by any means improved by the exhalations of the cattle, and the risk of fire is intensified. The most impervious floor is the best, and I advise any of the many forms of Portland-cement concrete, whether called Granolithic, Imperial stone, or Wilkinson's patent concrete is immaterial, so long as the cement is really good and the granite chips and shingle clean. I can speak in high terms of Wilkinson's work from practical experience.

The cow-house may next be described. It is a great point here, as well as in the calf-house and stable, to insure an equal temperature and perfect ventilation. Where the buildings are of brick, hollow walls will be of great assistance, care being taken to have a thoroughly effectual damp-course of slates in cement, and two or three courses of brickwork, also cemented under, to keep out the mice and rats, the great enemies of the farmer as far as his buildings are concerned. The usual width of a cow-house is about eighteen feet; this allows of a feeding-passage at the back of the manger of four feet. The floor should slope very slightly toward the heels of the cows, and there should then be a drop of four inches into a surface-gutter, about one foot six inches wide, and the remainder will form the usual gangway. It is not necessary to divide the building up into stalls, but it is better to do so at the manger. This is done in the simplest way with oak paling. The mangers should be constructed of some hard and impervious material. There are very good purposely-made glazed terra-cotta bricks for this purpose. Hard, blue Staffordshire bricks also do very well; but one of the simplest and best mangers is formed by using the large-sized half-pipes of glazed stoneware used for drainage works, bedded on concrete, and having an oak capping. The joints are fewer and easier made than with the other materials mentioned. I am referring more particularly to home-made fittings, in contradistinction to the iron fittings manufactured by those firms who devote their energies to stable-fittings. The cost of these would be more than the ordinary buildings would carry; although for dairy farms, and in those establishments of a more or less show character, they are very effective. But the strongest fittings, and those which are least likely to cost money in repairs or to need repairs, are those best suited to the farmer. Again, the simplest methods of ventilation are the best; and the system I recommend is to carry up a large trough of wood, about two feet six inches broad at the base, gradually decreasing to about one foot three inches at the outlet, and having a plain cap at the top. The sides should be formed in two thicknesses, and the space between filled with sawdust. Sufficient air will find its way in by the door and windows to thoroughly change the air in a very short time. One ventilator in about every fifteen feet of length will suffice. The doors of a cow-house should always open outwards, and should not be less than four feet wide; four feet six inches is a better width, and sliding doors are best. But here, again, the question of cost will probably intervene. It is better, if possible, to use nothing in the way of hinges or bolts, etc., except the strongest, and those only that can be made or repaired, if necessary, by the village smith. Avoid complicated patents.

The windows should be placed at such a height that if the upper portion is glazed it cannot be reached by the horns of the stock in the yards. The old-fashioned hit-and-miss window, strongly made in wood, is as good as anything, and if with a small quantity of glass over, will answer every purpose. Where the glass is omitted in the windows, a few glass slates or tiles in the roof will be of use. Cast-iron hit-and-miss windows can be obtained from many founders. The cost of one, three feet six inches by two feet six inches, will be about 25*s.*, list price. In the stable the stall divisions, which should be about nine feet deep, should be six feet three inches apart, centre to centre, and should be thoroughly strong; the mangers should be much as described for the cow-house; but one must bear in mind that the horse is rather a dainty feeder and has a very strong objection to dirt. Therefore, to avoid waste, it is a good thing to have the mangers of some materials easily kept clean, and here, again, any strong glazed ware will be found the best. A cart-horse stable should be, at least, eighteen feet wide, and that dimension is quite sufficient. But it must be borne in mind that the harness, etc., is frequently kept in the stable (although this is a bad thing to do), and provision should be made for, at any rate, temporarily placing the saddles, etc., on rests until they can be put away in the gear-house. As regards ventilation, the same as described for the cow-house will answer admirably. But avoid, if possible, any cross draughts, and if you are obliged, as may sometimes happen, to put either windows or ventilators in the same side as the mangers, keep them as high as possible.

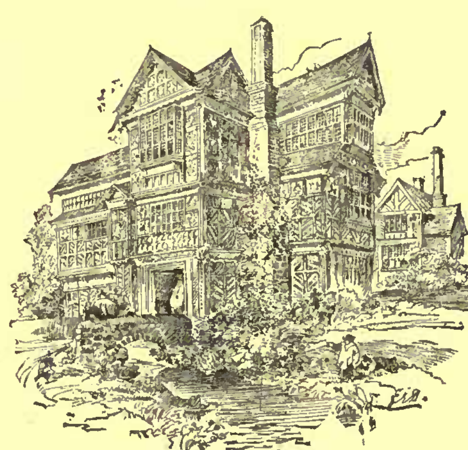
[1] A paper read by Arthur Young, before the London Architectural Association, February 6, 1885, and published in *The Building News*.

The horses are usually brought into the stables reeking hot from ploughing or other work in the winter, and would then be particularly susceptible to cold. I do not think, even in the best stables, it is a good thing to lay on water to the drinking-pot forming part of some iron mangers. A horse will drink with much greater zest from a freshly-drawn bucket of clear water than from a slimy trough that may have been standing for days, and it is more natural for a horse to drink from the ground level, and not from a raised trough; he can get his nose much better into the bucket. If you are compelled, from motives of economy or want of space, to place lofts for hay or corn over the stable (only do so when you are absolutely obliged), be sure and have the loft-floor of cement.

The old plaster floors cannot be beaten for this purpose, as they are rather warmer than a Portland cement concrete; but in ordinary farm buildings it will rarely happen that you will have to place lofts over any of the buildings; but in hunting stables, and those attached to country houses the architect is obliged to put his lofts on the upper floor, and this arrangement has many conveniences; but, wherever possible, put lofts over coach-houses, harness-rooms, etc., and only put a passage for service over the stable. I fancy, as a rough rule in large stables, about half of the superficial area of the stable would give the requisite amount of floor-space for the lofts. It is a good thing, where mice are very destructive, to cover the floor and line the walls with thin zinc. The harness and gear house should be placed as near to the stable as possible, and should be about eight feet wide, and should have a fire-opening and flue, as here the farm laborers who are not boarded occasionally sit to take their "bit on the thumb," and it is frequently useful to be able to make up a fire quickly to heat a bran-mash or boil food for the pigs; and a fireplace here saves a journey to, and gossip in, the farm kitchen. Harness fittings should be of the strongest and rudest description; there is nothing better than strong oak pegs, built well into the wall. The gear-house should have a good-sized window. A small space should also be provided for storing, under lock and key, artificial manures and oil-cake. The floor of this department should be of wood, with about half an inch between each board, and plenty of ventilation under, as oil-cake very quickly gets mouldy, and requires to be kept in a dry and well-ventilated place. Between the stable and the cow-house is the best situation for the root and chaff cutting place; in small farms, an area about twelve feet by eighteen feet will do, but in larger ones these dimensions should be increased. As the roots will probably be stacked and bedded on the opposite side of the stable range to the crew-yard, it is necessary to have a door at both ends of the building. In the ordinary way, of course, the machines will be worked by hand; but on large farms, and in other cases where steam power is used for other purposes, the chaff-cutting, pulping, etc., will be done by steam power. In this set of buildings the same engine, one of about ten-horse power, drives the sawing-machines, and also does the chaff and root cutting, etc., the gearing being interchangeable. The barn is now built very much smaller than used to be the case. Unfortunately in recent years the farmer has been only too anxious to get his corn thrashed and sold, and there has been little use made of the barn for long storing — thirty-five feet to fifty feet by twenty feet will nowadays be considered a good barn. It is usual to put the doors of such size that a wagon can be driven through it, and about a third of the barn has a sort of loft over. Cement makes the best floor, and it is a good thing to render the walls in cement for about five feet in height all round. Sufficient ventilation is gained by putting a few air-slits, which should be covered with bird-netting to keep out intrusive sparrows. I have now taken you round most of the buildings, and there remain only to describe the open sheds for various purposes and the piggeries. Open sheds are required first in the crew-yards, for the protection of the fattening stock, and next for the covering of the various implements, wagons, and carts. The construction of them all is similar on three sides, inclosed by walls, and open on the fourth. On the open sides the roof should be supported by story posts of wood or iron, and these should be placed on stone bases. The top of the stone base should be about one foot above the level of the paving of the yard, to keep the wood or iron post away from the damp bedding laid down for the beasts. Great care should be taken with the principal trusses of the sheds, as, indeed, throughout farm buildings, and I think that on the whole the queen-post truss is the best one to adopt; and it is a good point to make the tie-beams deeper and stronger than usual, as the principals will most likely be called upon to carry the ladders, sheep trays, and all sorts of poles, etc., that are wanted out of the way. While the sheds should get all the sun possible, so the south-east is the best aspect for them; with the cart and implement shed the reverse is the case, as they should be sheltered as much as possible from the sun, and also from the rainy quarter, which in most English districts is the south-west; so that the best position for the cart shed is facing north-east. It should also be on the main farm road if possible. About fifteen feet is a good depth for these sheds. In many cases an additional useful room could be obtained for standing implements by bringing down the eaves of the barn to take anything not finding sufficient length of room in the cart shed. This would be cheaper than increasing the width of the shed throughout. An important point is to get a good isolated infirmary box. This should be about fourteen feet square, and as much apart from the other stables, etc., as the yard will allow; but should be within easy reach of the farm-house.

Over the infirmary box in the buildings shown on the wall, I have arranged the pigeon-cot, or dove-'us, as it is called in Northamptonshire. The great point in arranging a dove-'us is to provide plenty of nests, and in building with brick this is easily done. The plan of the nest is this: A table in the centre, a looking-glass, and a good lump of salt, complete the furniture of the most improved pigeon-cot. It is a good thing not to put an external door, as the pigeons are easily stolen by putting a net over the pigeon-holes and then rattling the doors, which startles the birds, driving them into the nets. Of course this applies more particularly to those detached buildings at some little distance from the house. As to the question of laborers' cottages and working portions of the farm-houses, the item of cost is the great one that requires attention, and the points for us, as architects, to consider how best we can build the most durable buildings, leaving to the farmer and land agent to give us in each case the particular requirements, and having obtained from them the number of horses likely to be required on the farm, and the number of cattle kept, then to give them necessary accommodation, and to do this always with the materials ready to our hands. I am having continually impressed upon me that the cost of buildings erected recently is really greater than the land can bear, and that we ought to turn our attention to devising, if it be possible, cheaper modes of construction. I am of opinion that farm premises might be cheaply erected in concrete in many districts. Then the question of roofing material is also a most important one. Galvanized iron is recommended by many as the coming material. I cannot say that I have yet seen it introduced in an architectural manner; and it seems to me lacking in the first essential for roofing material — durability. It will do admirably for open barns and in similar positions, but how long will it last, water-tight, without painting? Not quite long enough to repay the first cost, I am afraid. We have a difficult problem to work out. Let us do it well — with beauty, if possible — but always with truth.

HEATING GREENHOUSES.


Woodlands Hall, England.

At the weekly meeting of the Massachusetts Horticultural Society, which was held Saturday, March 21, Mr. J. H. Woodford read a paper on the subject of "Heating Greenhouses." He said that he knew of only two horticulturists who are trying to improve their heating-apparatus by their own handiwork, and what they are trying for is simplicity of construction, economy of fuel, and at the same time efficiency. In the one case a bank of horizontal pipes surmounted by a coil of pipes and all surrounded by brickwork does good service, but at the expense of great waste of heat, which passes away up chimney, and ought not to be allowed to escape without doing service. This waste heat might be used in heating the water used in watering the plants by placing in the chimney, in such a manner as not to interfere with the draught, a stack of pipe through which the water should pass before using. This would be economy in the use of fuel, for we all know that great quantities of heat pass off up chimney, which does no work and is wasted. Some authorities who have looked into this important subject pretend to say that half of all the heat generated in or under the best of our horticultural heating-apparatus passes off without doing any good except to help to heat up all outdoors. If we could build a fire which would last all night, and at the same time be of such intensity as just sufficient to properly heat the water in our boiler, then there would not be any appreciable waste of heat. But as this cannot be done, the question comes up what can be done with the heat after it has done its work under the boiler and is on its way up chimney. If one cannot use this waste heat in any other way, it would be well to use a coil of pipe in the chimney, where forced water is used, for all the water passing through it would become warmed to such a degree as to make it much more acceptable to growing plants than cold water direct from the service-pipes or cistern. A gentleman has built with his own hands a bank of pipe with the ends built with the surrounding brickwork and a fire-box underneath. The construction is faulty. On the top of the brickwork he has enclosed another space through which he carries the water-pipe to irrigate his growing crops. No doubt but this last will be beneficial, but by this process he does not utilize the waste heat, but is drawing constantly from the heated furnace. He could get better results by carrying the irrigating water through a coil of pipes in the chimney. We all know that the temperature of a greenhouse can readily be reduced and the growth of plants badly checked by the promiscuous introduction of

cold water, and therefore we see the necessity of providing an economical means of supplying only warm water to growing plants.

A greenhouse heater should be constructed on scientific principles, such as adaptability for the purpose for which it is intended, simplicity of construction, and the easy way in which to get at it for cleaning and repairs. Under the first proposition we will say that heating greenhouses by hot water or steam are now conceded to be the best methods in use, and now comes the vital question: How can we heat water the most economically, either to circulate through the pipes as water or as steam, and the most expeditiously? Shall we continue blindly to use those boilers which are constructed in such a manner as to present to the fire a great mass of water in one solid body to be heated, or shall our boiler be constructed of pipes, whereby the same body of water shall be exposed to the warming influence in small streams and in the same space?

The same fire will heat water much hotter when it passes through tubes in a boiler than when we have a great mass of water presented to the fire at one time. The plan should be to have the water come under the influence of the fire in small, continuous bodies, so as to utilize the heat as much as possible before it passes away. The speaker here illustrated by means of diagrams the details of his plan of boiler construction. He said that the hotter the water can be made in confinement the faster it will travel through the pipes, and in this way only can a large space be heated, either by hot water or steam. The construction can be very simple, and not expensive; a bank of one-and-one-half-inch pipe occupying a space five feet long, two feet high, and two feet wide, divided in the middle by tiles, so that the heat from the fire built under one end shall pass through the bank twice before reaching the chimney; and the bank of pipe inclosed in brickwork, the top of the brickwork resting on gas-pipe, the whole of which should project into the greenhouse, thereby saving all the heat radiated from the furnace. The feed-door should be outside, to prevent coal-gas from entering the greenhouse while stoking. This plan will make a fire-box two feet wide by two feet long, which should be of sufficient capacity to heat a greenhouse twenty feet wide by one hundred feet long. The water will pass in at the bottom of the bank of pipes and out at the top, thus being in one continuous stream of one hundred feet long through the bank of pipes, thereby heating it quickly.

The flow of water in one stream through such a length of pipe one hundred feet, and over a live fire, ought to heat the water very hot in a short space of time, thereby causing it to flow through the radiating pipes with such velocity as to cause its return to the boiler before it loses its heat. This is the great secret of successful heating, by which we shall not require such large radiating pipes as four inches diameter to heat our greenhouses, nor so many of them, for what we require to properly do the work will be kept very hot the entire length, by the constant and expeditious passing of hot water through the fire in one continuous small stream. The flow-pipe should be constructed in such a manner, as it passes from the boiler, to immediately empty itself into a stand or expansion pipe near the boiler, and on top of this stand-pipe we should have a valve which would withstand a pressure in case of the great heat in the water inducing steam. The stand-pipe can be placed in such a position in the greenhouse, and the flow taken from it at such a depression as to preclude the necessity of placing the boiler below the level of the surface of the soil in the greenhouse. The chimney should receive the smoke on a level or lower down than the grate, so that all the gases from the coal will be consumed over the fire and among the pipes constituting the boiler. — *Boston Journal.*

A QUESTION ON FLUES.

SANDUSKY, O., March 25, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,—Having read a good deal about ventilation, and finding practice quite different from theory in some cases, you will allow me to ask the following question through your valuable paper, namely: What will be the general result, if the furnace, grate and ventilating flues of say a three-story building, are run up separate to the ceiling of the last floor, and then all flues unite in one? Will some ventilator please inform IGNORANCE.

[IN mild weather some smoke from the range flue would be likely to creep down the ventilating flues.—EDS. AMERICAN ARCHITECT.]

COMPETITIONS.

BOSTON, March 29, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I should judge that your correspondent, "Clef," was a person of slight imaginative faculty, for he seems quite unable to perceive the bearing of the several suppositions I recently advanced; therefore I will not put forward any others, but will reply briefly to his letter in your issue of yesterday by saying: —

First, that I did not suggest the inference that "every one is an equally competent judge in matters of taste," but I will accept the inference with the interpolation of the words "thinks he" after the words "every one."

Next, I did not confine my promenade amongst tailors to the "well-known" Snips alone. My only object was to get my suit built according to my own taste, — and I succeeded.

Next, if legal competitions such as I invented had had actual existence, they would not have been mentioned, and "Clef" could not then have overlooked the point that my dubitation concerned not the manner in which such competitions would be held, but whether, there being such competitions, lawyers would or would not take part in them.

The scheme I suggested, and which you have thought well enough of to try to put in practice, was not presented as the best that could be devised, for it had not occurred to me when I began to write; but I do think it is a reasonable way of securing a certain measure of improvement in this much-vexed matter.

Very truly yours, W.

COLUMBUS, O., March 26, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — In your journal of the 14th you urge each of your readers to write to you concerning your proposed change in terms of the competition for Richmond City-Hall.

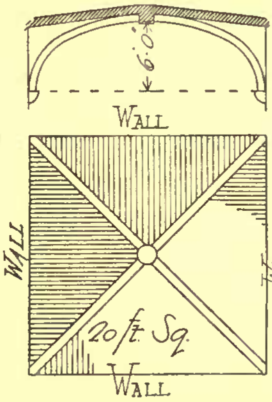
Before expressing an opinion, I desire to be sure that I understand what kind of a competition it is you suggest, and not being able to satisfy myself from the pages of your paper, I ask, for information, the question: Is the competition to be limited to the "ten champions of reform," or is it to be open to all who desire to enter it?

If you will be kind enough to answer this question, I will be ready to say what I think of the "competition" you propose.

Respectfully yours, J. W. YOST.

[THE competition we have suggested is intended to be open to all. The scheme, if accepted, will secure to the Richmond authorities ten designs of assured merit in addition to all the other designs which might be submitted. Moreover, on the reconstructed programme, a large number of designs of equal merit with those of the selected ten would probably be received.—EDS. AMERICAN ARCHITECT.]

CENTRES FOR A GROINED VAULT.



HARTFORD, CONN., March 16, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Will you be so kind as to describe in your valuable journal the method of laying out the centres for a groined vault; the diagonal ribs being a segmental arch, and the crown of the same 1′ 3″ higher than the crown of the side arches. There are to be no wall-ribs; the arches are of brick and the diagonal ribs of stone.

Respectfully,

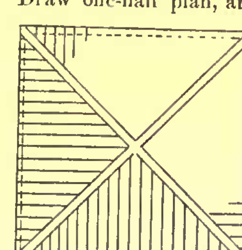
A. VAULT.

BOSTON, March 19, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — It is assumed that the writer means the wooden *centre* for turning the vault on, and not the point from which to describe the arc.

Draw out the curve of the soffit on the wall side, and showing the section at the centre of the cross vault. Draw one-half plan, and from there work out by the principles of projection the form of the diagonal ribs. It will be elliptical in shape if the vaults are segmental. Having worked out by means of points the curve of the diagonal ribs, I would construct centres for these, with plank on each side, rising to the soffit of vault. Set these centres in place, and a centre for the wall sides, and connect these latter centres with the ribs by means of plank, as shown in sketch. The brick can then be laid on these. If the courses of brick are laid vertically, the soffit will be a succession of very slight steps, and if the courses are laid at right angles to the soffit, so as to make it true, it would probably improve the appearance to have wall-ribs.



Very truly yours,

F. E. KIDDER.

HAY-CHUTES.

CLEVELAND, O., March 23, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Gentlemen, — I have noticed in the criticisms of various plans submitted in your stable competition, that the jury seems to be strongly in favor of separate hay-chutes to each stall, and I write to see if they will be kind enough to give their reasons for the same.

My experience has been that it is better not to use them, because with them we must either with an open chute sprinkle hay-seed in the horse's face, or with a closed one use what I have heard called "starvation mangers," *i.e.*, the round iron corner rack at the bottom of the chute. The open chute in the aisle or passage makes the stable man more work, but it gives the horses a low open manger,

keeps their manes cleaner, and makes the man keep the stable neater. It is very seldom that we hear of an overworked stable man in these private city stables.

Hoping to hear some reasons on the other side, I remain

Very sincerely yours, Clarence O. Arey.

ECHO IN A ROOM.

Brooklyn, March 6, 1885.

To the Editors of the American Architect: —

Dear Sirs, — Can you inform me, in the *American Architect,* of some simple and inexpensive method to overcome an echo in a room to be used for singing purposes, but used generally as a dancing-room, not carpeted. The room is forty-five feet by eighty-five feet, and twenty-eight feet high to ceiling, which is flat, but with a five-foot cove underneath it, extending entirely around the room.

The floor is laid on sleepers attached to iron beams, and the ceiling is on wire-lath, — iron meshing attached to iron purlins.

Respectfully, Mercein Thomas.

[We should be inclined to try first the effect of hanging cloth all around the room, over about two-thirds the height of the wall. It would look best, and probably be most effectual, to stretch the cloth, which might be any light cotton or woollen material, on frames, with a small moulding at top and bottom, so as to form a band extending from the dado, if there be one, to within a few feet of the cornice. This would correct what is probably the main defect of the room, the hardness of the wall surfaces, and would tend, also, by introducing strong horizontal lines, to overcome the want of proportion between the width and height. If an echo from the ceiling should still remain, it may be dealt with by decorating it with cloth in the same manner.—Eds. American Architect.]

MEDIÆVAL.

Kansas City, Mo.

To the Editors of the American Architect: —

Dear Sirs, — Can you inform me through your valuable paper the meaning of mediæval, a word I frequently meet with in architectural books, and oblige Yours, etc., J. G. B.

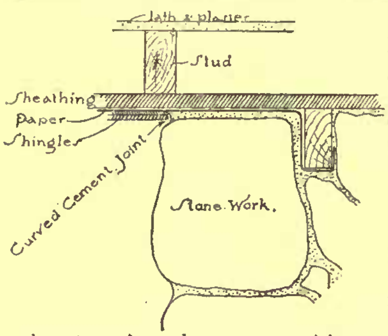
["Mediæval" is an adjective qualificative of nouns which have reference to the Middle Ages. The Middle Ages are often considered the centuries elapsing between the Fall of the Western Empire, A.D., 476, and the discovery of America in 1492; but as the world was expected to come to an end in the year 1000, and people with this expectation before them had become unprogressive and degraded, the period between 476 and 1000 is usually styled the Dark Ages; so that practically the word mediæval is generally used in speaking of the period between 500 and 1500.—Eds. American Architect.]

A CORRECTION.

St. Paul, Minn., March 18, 1885.

To the Editors of the American Architect: —

Dear Sirs, — Permit me to correct a mistake made by your draughtsman in reproducing my sketch of the junction of a wood and a stone wall in house at Dellwood, as published in the magazine March 14. My original sketch, as per letter-press copy, shows a curved cement joint for edges of shingles to butt against, as shown in accompanying sketch. The sketch as re-drawn and published, as above, represents the cement carried back of shingles, without the necessary furring to lath against, and showing the shingles apparently set against the cement without nailings, which would be an impossibility in this work, besides not being at all what was really done. The error was probably caused by a blur on my drawing, made in taking a letter-press copy, which obscured the drawing at the point in question.



I am confident that you will permit me this correction, though it is so small a matter. Yours respectfully,

Cass Gilbert.

NOTES AND CLIPPINGS.

Preserving Timber. — About five years ago the chemist of a corporation in the United States, wishing to preserve shingles against decay, and also render them incombustible, impregnated them with lime and salt, by boiling them in a solution of ten pounds of salt and twenty pounds of lime with two hundred and fifty gallons (twenty-five hundred pounds) water. Ten bundles of shingles were boiled until thoroughly saturated, the process costing fifty cents per thousand shingles. These prepared shingles have been used for roofing purposes, both with and without the protection afforded by paint, and the result has proved in every way satisfactory. Recently some prepared shingles were subjected to trials in competition with ordinary shingles. They were dipped into naphtha and lighted, the ordinary shingle burning until consumed, while the flame on the prepared shingle went out as soon as the naphtha was burned, and without igniting the shingle. A spark test made by a burning mixture of charcoal, sulphur, and saltpetre on the shingles, burned the ordinary shingles, but only charred those which were prepared. Exposure to gas flames showed similar resistance to combustion in the prepared shingles. The antiseptic properties of lime upon wood and iron are well known, the only element of uncertainty being the rate at which such lime and salt deposits in the pores of the wood would be removed by rain storms. The experience of five years shows that this decrease is a slow one, and may be retarded by paint. It is considered that such preparations may be applied more thoroughly to green lumber where the sap cells are still open and capable of absorbing moisture than in seasoned stock, which cannot have so much permeability. — *Engineering.*

A Canadian on American Architecture. — The Montreal *Witness* pays this tribute to the progress in architecture in this country: "The United States is soon going to take the lead of older countries in the matter of modern architecture, as it is natural that it should. A rapidly developing country, constantly requiring new conveniences, offers the most promising field for the ablest men of the age, and scarce a week passes that the American illustrated papers are not adorned with pictures of some new public building, grand in extent, of original design and of surpassing beauty. The young Western cities which have sprung up within the æsthetic era are fairy lands as compared with the new towns of thirty years ago."

Cost of Purchases for the National Gallery for Twenty-four Years. — A Parliamentary return has been issued showing the sums expended by the Trustees of the National Gallery in each year from 1860 to 1884 inclusive, from moneys provided by Parliament in the purchase of pictures. The total sum so expended during that period has been £250,100. Apart from the years 1871-2 and 1872-3, the returns for which are *nil*, the smallest amount expended in any one year was £350 (1877-8) and the largest £76,500 (1870-1). This is by a long way the largest sum spent in any year embraced in the return, the nearest approach to it being £25,299 in 1882-83. The figures for other years vary from £2,819 to £16,678. During the period mentioned, no single picture was purchased for a sum of or exceeding £10,000, but the following prices above that amount have been paid for groups of pictures purchased at the same time out of one collection: £75,000 for 77 pictures and 13 drawings purchased from Sir Robert Peel's collection in 1870-1, £10,395 for 13 pictures from the Barker collection in 1874-5, and £21,042 for 10 pictures from the Duke of Hamilton's collection in 1882-3. — *N. Y. Evening Post.*

Gaseous Fuel. — A correspondent of a Yorkshire paper discusses a practically illimitable sphere of work for gas companies. Living in a district where tall chimneys incessantly obscure the sky with clouds of black smoke, it has occurred to him that th s horrible pall represents an immense waste of heat as well as of fuel. The bigger the chimney, the more heat is drawn up by it from the fire or furnace beneath, and the whole volume of this caloric is absolutely wasted. But if gaseous fuel were used instead of solid, there would be no smoke, therefore no need of chimneys great or little, and consequently the whole heat generated could be utilized. It is further claimed that boilers would last much longer, and that the cost would be less by one-fourth. Unfortunately, those who have had practical experience with the two sorts of fuel unanimously declare that gas, while very much to be preferred for cleanliness and convenience, is much more expensive. It is possible, however, that the companies could manufacture a less costly article for this purpose than they now purvey for illumination. — *N. Y. Evening Post.*

The African Inland Sea. — A party of French Engineers and hydrographers has left for Tunis, charged with making the necessary studies on the spot, for the construction of the harbor in the Bay of Gabes, at the mouth of the Oued Mellah, in connection with the canal which is to establish navigable communication between the Mediterranean and the Chotts. It will be remembered that, in the early spring of 1883, M. de Lesseps made a trip to those great marsh lakes in Southern Tunis, which it is the intention to convert into a vast inland sea, with a view of testing the results of the late Colonel Roudaire's survey, and that he came back convinced that the scheme was practicable. The expedition which has now started will also make investigations as to the feasibility of sinking artesian wells along the route, and the survey for a railway which it might hereafter be thought necessary to construct. The head of the expedition is Commandant Landas, Professor of Topography at the school of Saint Cyr. He is accompanied by M. Baronnet, who assisted Colonel Roudaire in making the preliminary surveys, and several other engineers. It may be advisable to recall to mind the chief features of the report on the undertaking which M. de Lesseps published after his return from Tunis in 1883. It states that the estuary of the Oued Mellah, which is to be the beginning of the canal leading to the Chotts to be inundated, offers a part, covered at high water, of sufficient breadth which might easily be excavated, and would form a part sheltered by nature from all the winds from north-east to south passing by the west. The winds from northeast to south passing by the east would not be dangerous to the breakwaters. The roads in front of the entrance are, moreover, in exactly the same situation as those of Gabes. The navigation in the canal, according to the report, would offer no difficulty, as the canal would form almost a straight line. The calcareous rocks found by Colonel Roudaire's soundings in 1879 at the base of the Gabes bar, but of comparatively unimportant extent, are an advantage rather than an inconvenience at the mouth of the canal. They will furnish the requisite material for the construction of the pier and port buildings. M. de Lesseps thinks that, considering the nature of the soil traversed, it will be sufficient to cut, in the alluvial part, a canal, on the average 80 to 100 feet wide, which will be further widened by the action of the current. This cutting could be executed in the maximum period of five years, at an estimated cost of £6,000,000. The proposed inland sea would be fifteen times as large as the Lake of Geneva. It has an elevation much lower than the level of the Mediterranean, the depression being in some places as low as 165 feet below that level. — *London Iron.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

BUILDING PATENTS.

[*Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.*]

313,844. COMBINED SCREEN AND STORM-DOOR. — Charles Anderson, Downer's Grove, Ill.
313,852-853. ROOFING FINISHING. — Lewis D. Cortright, Hyde Park, Ill.
313,859. BLIND-TENON. — John Forhan, New York, N. Y.
313,865. VENTILATING-LOUVRE. — George Haven, New York, N. Y.
313,867. TANK. — Elijah Hines, Batavia, Ill.
D 313,876. REFRIGERATOR-DOOR. — George A. McArthur, Pullman, Ill.
313,883. STEAM-RADIATOR. — Leon H. Prentice, Waukegan, Ill.
313,887. ELEVATOR. — George H. Roehm, Dayton, O.
313,888. LOCK-BOLT FOR DOORS. — John B. Schroder, Cincinnati, O.
313,913. APPARATUS FOR TREATING, SEASONING AND PRESERVING TIMBER. — John B. Blythe, Bordeaux, France.
313,919. BLIND-SLAT FASTENING. — Eben M. Coffin, Hubbardston, Mass.
313,921. WEATHER-STRIP. — John Cortrell, Schell City, Mo.
313,930. BRICK FOR VENEERING FRAME HOUSES AND OTHER WOODEN BUILDINGS. — Millard F. Ellis, Atchison, Kans.
313,941. ELECTRIC BELL. — Charles E. Kells, Jr., New Orleans, Kans.
313,942. BAR FOR SECURING DOORS AND SHUTTERS. — Charles H. Knauer, Phœnixville, Pa.
313,943. BENCH-DOG. — Martin J. Kugler, Barnesville, O.
313,950. BIT-BRACE. — Johannes T. Pedersen, Brooklyn, N. Y.
313,971. FIRE-PROOF COMPOSITE ROOF. — Thomas H. White, St. Louis, Mo.
313,998. HOT-AIR GENERATOR FOR FIREPLACES. — Jesse S. Deardorff, Canal Dover, O.
314,005. HANGING DOOR. — Charles W. Emerson, Charlestown, Mass.
314,011. LOCK-MORTISING CHISEL. — Philo L. Fox, Bridgeport, Conn.
314,022. BRICK. — William Heard, Brooklyn, N.Y.
314,026. ILLUMINATING BASEMENTS. — Peter H. Jackson, San Francisco, Cal.
314,058. BENCH-HOOK. — Joseph B. Sargent, New Haven, Conn.
314,075. ASSEMBLING-BOLT. — J. Galusha Staunton, Ellicottville, N. Y.
314,076. ROOF. — J. Galusha Staunton, Ellicottville, N. Y.
314,105. HINGE-LOCK FOR SHUTTERS. — Serena M. Carnes, New York, N. Y.
314,114. MANUFACTURE AND PRESERVATION OF ARTICLES OF GYPSUM, STUCCO, OR THE LIKE. — Maximilian Dennstedt, Tzscheoheln-Niederlansitz, Prussia, Germany.
314,128. RADIATOR. — William Hopkins, Dubuque, Iowa.
314,145. WATER-CLOSET. — James Muirhead, Olneyville, R. I.
314,147. HASP-LOCK. — Charles Neblet, Cincinnati, Ohio.
314,162. SASH-FASTENER. — John Ashton, Philadelphia, Pa.
314,177. DOOR-HANGER. — George W. Hey, Syracuse, N. Y.
314,201. SASH-SUPPORTER. — Jason D. Simmons, Chicago, Ill.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report thirty-one permits have been granted, the more important of which are the following: —

W. H. Falconer, three-st'y brick building, s s Franklin St., between Greene and Paca Sts.

Chas. L. & J. S. Clark, 5 three-st'y brick buildings, w s Eden St., commencing cor. Oliver St.

P. McGuire, three-st'y brick building, e s Pine St., n of Baltimore St.

J. T. Grindall, 5 two-st'y brick buildings, e s Battery Ave., s of Fort Ave., and 6 two-st'y brick buildings, w s Battery Ave., s of Fort Ave.

C. J. Fox, 8 three-st'y brick buildings, e s John St., commencing s e cor. McMechen St.

J. H. Themeyer, three-st'y brick building, e s Caroline St., between Lancaster and Thames Sts.

Wm. Aimey; 19 two-st'y brick buildings, w s Hanover St., between Wells and Winder Sts.

D. E. Potter, 12 two-st'y brick buildings, e s Race St., commencing s e cor. Cross St.

Henry Cronhard, three-st'y brick building, s s Madison St., between Spring and Caroline Sts.

Boston Fe[illegible]er, 7 two-st'y brick buildings, s s Winchester St., w of Fremont St., and 8 two-st'y brick buildings in rear.

Boston.

BUILDING PERMITS. — *Wood.* — *Quincy St.*, cor. Blue Hill Ave. dwell., 2[illegible]′ 6″ x 38′; Benjamin Pope, owner; Max Wiese, builder.

Tremlett St., cor. Washington St., dwell., 24′ x 36′; John French, owner and builder.

Fairview St., cor. Proctor St., dwell., 22′ x 32′; John Fraser, owner and builder.

East Chester Pk., junction Swett St., store, 36′ x 38′; J. McBarron, owner; James Hanning, builder.

Evans St., cor. Corbett St., dwell., 23′ 6″ x 32′; W. A. McAuley, owner and builder.

Sheridan Ave., *No.* 43, dwell., 24′ x 30′; T. B. Hall, owner; M. Sullivan, builder.

Brooks St., *No.* 22, dwell., 22′ 6″ x 36′; D. Murphy, owner; A. J. McLaven, builder.

Brooks St., *No.* 20, cor. Chelsea St., dwell., 22′ 6″ x 36′; D. Murphy, owner; A. J. McLaven, builder.

Dana Pl., dwell., 20′ x 40′; A. B. Pinkham, owner; Pinkham & Russell, builders.

Dana Pl., dwell., 20′ x 40′; C. A. Russell, owner; Pinkham & Russell; builders.

Ray St., near Regent St., dwell., 22′ x 40′; W. A. Whelan, owner; Pinkham & Russell, builders.

Brick. — *Albany St.*, *No.* 157, dwell. and store, 19′ 6″ x 55′; Joseph Graham, owner and builder.

Middlesex St., *Nos.* 65-67, apartment-house, 24′ x 50′; N. & S. A. O. Sullivan, owners; Sullivan Bros., builders.

St. Botolph St., *No.* 117, dwell., 25′ x 64′; G. M. Gibson, owner; Thomas R. White, builder.

St. Botolph St., *No.* 119, dwell., 25′ x 64′; R. H. Allen, owner; Thomas R. White, builder.

St. Botolph St., *Nos.* 121-133, 7 dwells., 25′ x 64′; Z. N. Thompson, owner; Thomas R. White, builder.

Dover St., *No.* 68, cor. Shawmut Ave., dwell., 20′ 6″ x 58′; H. H. Fitch, owner; J. E. Potter, builder.

Dover St., cor. Hingham St., dwell., 24′ x 58′; Trustees; J. E. Potter, builder.

Brooklyn.

BUILDING PERMITS. — *Fifth Ave.*, w s, 25′ s Warren St., three-st'y brick store and tenement, tin roof, wooden cornice; cost, $7,000; owner, Wm. H. Chubb, 430 Wyckoff St.; architect, C. Werner.

Woodbine St., n s, 125′ w Evergreen Ave., 2 two-st'y frame dwells. (brick-filled), tin roof; cost, $3,000; owner, architect and builder, Frederick Marryatt, 77 Woodbine St.

Greene Ave., s s, 300′ w Tompkins Ave., 5 three-st'y brown-stone dwells., tin roofs; cost, $6,000; owner and builder, R. C. Addy, 592 Willoughby Ave.

De Kalb Ave., n s, 222′ 8″ w Myrtle Ave., 2 two-sty, frame dwells. (brick-filled), tin roof; cost, each, $1,800; owner and architect, James W. Lamb, 84 Bushwick Ave.; builder, A. J. Lamb.

Scholes St., *No.* 259, s s, 400′ e Bushwick Ave., three-st'y frame tenement (brick-filled), tin roof; cost, $4,000; owner and architect, Charles Mitchel, 256 Scholes St.; builders, C. Buchheit and C. Wiebauer.

Third Pl., n s, 161′ e Henry St., 4 three-st'y and basement brown-stone dwells., tin roofs; cost, each, $5,000; owners, John and Jas. Williamson, 23 and 25 Third Pl.; architect, M. J. Morrell; builder, P. J. Carlin; contractor not selected.

Clinton St., s w cor. Union St., 6 three-st'y Connecticut brown-stone dwells.; and *Union St.*, s s, 81′ 8″ w Clinton St., 2 three-st'y and basement Connecticut brown-stone dwells., tin roofs; cost, each, $6,500; owner, Julius Wadsworth, New York; architect and builder, George Lowden.

Dean St., s s, *No.* 1294, two-st'y and basement dwell., tin roof; cost, $4,500; owner, H. D. Eastman, 1292 Dean St.; architect, J. T. Miller; builder, W. W. Eastman.

Quincy St., s s, 293′ e Reid Ave., 2 two-st'y front and three-st'y rear brick dwells., tin roofs; cost, each, $4,500; owner, A. S. Walsh, 643 Madison St.; architect and builder, A. Miller.

Lexington Ave., s s, 100′ w Nostrand Ave., 18 two-st'y brick dwells., gravel and tin roofs; cost, about $4,200 each; owners, Jos. P. Puch and Wm. J. Northbridge, Lexington Ave., cor. Nostrand Ave.; architect, F. F. Jones; builders, Alex. Vanvorst and Young Bros.

Johnson Ave., *Plank Road*, s s, 125′ e old Bushwick Road, opposite L. I. R. R. freight depot, two-st'y frame storehouse, gravel roof; cost, $3,000; owners and architects, B. F. Conklin & Sons, Bushwick Ave., cor. Johnson Ave.; builders, J. Connor and J. Rueger.

Harrison Ave., *No.* 141, e s, 75′ s Gwinnett St., three-st'y frame store and tenement (brick-filled), tin roof; cost, $4,000; owner and builder, Adam Kessel, 143 Harrison Ave.; architect, Th. Engelhardt.

Broadway, e s, 33′ 1″ s Ewen St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $10,000; owner, F. Wiesbrod, on premises; architect, Th. Engelhardt.

Duffield St., *No.* 43, four-st'y and basement brick tenement, tin roof; cost, $8,000; owners, Parfitt Bros., Garfield Building.

ALTERATIONS. — *De Kalb Ave.*, s s, 100′ e Bushwick Ave., three-st'y brick extension, tin roof; also, wood entrance taken down and rebuilt of terra-cotta; cost, $10,000; owners, Little Sisters of the Poor, De Kalb and Bushwick Aves.; architects, Parfitt Bros.; builders, E. T. Rutan and H. J. Brown.

Fulton St., *Nos.* 398-404, interior alterations; cost, $3,500; owner, John French, 469 Clinton Ave.; architect, John Mumford; builder, Cornelius Cameron.

Chicago.

BUILDING PERMITS. — V. Slapak, three-st'y store and flats, 362 Eighteenth St.; cost, $9,000.

T. Colbenson, three-st'y dwell., 52 West Ohio St.; cost, $2,800.

H. B. Koenig, three-st'y dwell., rear 177 Wells St.; cost, $3,500.

Sanders & Rejon, three-st'y dwell., 91 Howe St.; cost, $4,000; architect, H. Sanders.

W. H. Thomas & Son, 5 cottages, 1093-1103 Hoyne Ave.; cost, $6,000.

W. H. Thomas & Son, 7 cottages, 156-168 Moore St.; cost, $8,000.

M. Hoy, three-st'y store and dwell., 89 Thirteenth Pl.; cost, $3,500.

J. Baumeister, two-st'y dwell., 156 Newbery Ave.; cost, $2,500.

J. Peklo, three-st'y store and flats, 582 Blue Island Ave.; cost, $9,000.

C. Lassau, three-st'y store and flats, 962 West Twelfth St.; cost, $7,500.

C. Panfrau, three-st'y flats, 76 Wilson St.; cost, 5,000.

F. H. Bailey, two-st'y dwell., rear 292 West Jackson St.; cost, $4,000.

J. Brucha, three-st'y dwell., 467 West Nineteenth St.; cost, $3,500.

J. Better, two-st'y store and dwell., 667 Ogden Ave.; cost, $2,500.

O. Knudson, basement and rear addition, 159 Hubbard St.; cost, $10,000.

J. Andrin, two-st'y dwell., 395 Ontario St.; cost, $7,500; architect, J. Addison; builders, Barney & Rodatz.

P. Benz, two-st'y dwell., 235 Irving Pl.; cost, $2,700; architect, T. Karls.

W. H. Pruyne, two-st'y dwell., 447 West Congress St.; cost, $4,500; architects, Wilson & Moody.

J. A. Schuster, two-st'y flats, 265 Dayton St.; cost, 3,300.

F. Brenning, two-st'y store and dwell., 728 Clybourne Ave.; cost, $3,500.

T. W. Snell, two-st'y dwell., 244 Burling St.; cost, $2,500.

M. Olsen, two-st'y dwell., 440 West Division St.; cost, $3.000.

F. Posta, three-st'y store and dwell., 171 Dekoven St.; cost, $8,000.

Chicago White Lead and Oil Works, four-st'y warehouse, 45-47 North Green St.; cost, $30,000; architect, F. H. Waescher; builder, Geo. Hinchliff.

D. Jaeger, three-st'y store and dwell., 315 Johnson St.; cost, $4,000.

A. Lonne, two-st'y dwell., 655 Lincoln St.; cost, $4,000.

C. Splinter, basement, 103 Chicago Ave.; cost, $3,000.

H. J. Cobb, two-st'y dwell., 72 Belleview Ave.; cost, $10,000; architects, Cobb & Frost; builders, Angus & Gendele.

F. Stiba, two-st'y dwell., 29 Newton St.; cost, $3,200.

W. H. Thomas, 4 three-st'y dwells., 8-14 South Morgan St.; cost, $20,000; architects, Wilson & Moody.

J. B. Chiappe, 2 two-st'y stores and dwells., 703-705 West Van Buren St.; cost, $5,000.

M. M. O'Hare, two-st'y store and dwell., 2404 Indiana Ave.; cost, $4,300; architect, A. McIntosh.

C. Kazminski, 2 two-st'y flats, 39-41 Orchard St.; cost, $3,000.

C. E. Loder, 5 two-st'y flats, 909-917 Harrison St.; cost, $18,000; architect, J. S. Huber.

J. Routa, two-st'y dwell., 433 Seventeenth St.; cost, $4,000; architect and builder, L. Novey.

Fortune Bros. Brewing Co., two-st'y barn; cost, $6,000.

B. Lathrop, store, cor. Dearborn and Van Buren Sts.; cost, $16,000.

A. Berkson Bros., three-st'y store and flats, 569 South Canal St.; cost, $6,000.

J. Daehla, two-st'y dwell., 418 North Lincoln St.; cost, $3,000; builder, A. Kollhorst.

J. Wihlin, two-st'y store and dwell., 61 West Ohio St.; cost, $6,000; architect, H. S. Kley.

Mrs. E. Blair, two-st'y dwell., 16 Clarkson Ct.; cost, $3,500; architect, J. Smith; builder, G. Hinchliff.

J. H. McVicker, 2 additional stories, 78-84 Madison St.; cost, $100,000; architects, Adler & Sullivan.

W. A. Stevens, three-st'y dwell., 2623-2625 Wabash Ave.; cost, $15,000; architect, L. B. Dixon; builders, Fox & Hinds.

C. Stigo, two-st'y store and dwell., 3250 Wentworth Ave.; cost, $4,100.

P. Tinkler, three-st'y flats, 30-32 Delaware Pl.; cost, $10,000; architects, Treat & Foltz; builder, L. Kabell.

J. Zahrenger, two-st'y dwell., 2917 Fifth Ave.; cost, $3,200; architect, Stude.

Mary J. Hodge, 3 two-st'y dwells., 549-551 West Jackson St.; cost, $12,000; architect, W. Strippelman; builder, D. H. Wilkie.

F. Schweinfurth, 8 two-st'y dwells., 2933-2945 Groveland Park Ave.; cost, $30,000; architect, W. L. B. Jenney.

Geo. Paul, two-st'y dwell., 781 Larrabee St.; cost, $5,000; builder, N. Gerten.

S. Svabader, two-st'y store and dwell., 619 Thirteenth Pl.; cost, $4,800.

M. C. Meyer, two-st'y store and dwell., 957 Ogden Ave.; cost, $3,500.

J. J. Huber, two-st'y dwell., 120 Orchard St.; cost, $3,500.

C. Appel, two-st'y dwell., 464-466 Larrabee St.; cost, $3,000.

J. Klein, two-st'y dwell., 617 West Chicago Ave.; cost, $3,000.

New York.

CLUB-HOUSE. — The Mount Morris Club will build a club-house on the s s of One Hundred and Twenty-fifth St., between Madison and Fifth Aves.

HOUSES. — It is reported that Messrs. Chas. Buek & Co. will erect, on the n e cor. of Madison Ave. and Sixty-ninth St., four first-class residences, at a cost of about $350,000.

OFFICE-BUILDING. — On the n s of Wall St., between Broadway and Nassau St., a first-class office-building is to be erected, from designs of Mr. H. J. Hardenbergh.

STORES. — For the Hunter Estate, a five-st'y building 29′ x 72′ and 66′ 7½″ x 80′ 3″, is to be erected on the n w cor. of Reade and Hudson Sts., with fronts of brick, terra-cotta and iron, from plans of Mr. G. M. Huss.

BUILDING PERMITS. — *Mulberry St.*, *No.* 194, two-st'y brick stable, gravel roof; cost, $9,000; owner, Patrick McCollum, 58 Prince St.; architect, Wm. Graul.

Norfolk St., *No.* 138, five-st'y brick store and workshop, tin roof; cost, $4,000; owner, Wolf Boroschek, 156 Henry St.; architect, Wm. Graul.

Scammel St., e s, 47′ n Cherry St., three-st'y brick stable, tin roof; owner, John Wallace, 55 West Thirty eighth St,; architect, Gage Insler.

Thirty-third St., n s, 81′ e Third Ave., 4 five-st'y brick tenements and stores, tin roofs; cost, each,

$20,000; owner, Marks Rinaldo, 230 East Thirty-third St.; architects, A. B. Ogden & Son.

West Forty-eighth St., *No.* 346, five-st'y brick tenement, tin roof; cost, $20,000; owner, Theodore Riehl, 203 West Forty-eighth St.; architects, Thom & Wilson.

Forty-ninth St., s s, 150′ e Ninth Ave., 2 five-st'y brick tenements, tin roofs; cost, each, $16,000; owner, George Kick, 345 West Twenty-ninth St.; architects, Thom & Wilson.

Forty-ninth St., s s, 125′ e Ninth Ave., five-st'y brick tenements, tin roofs; cost, $16,000; owner, Wm. Mulgrew, 221 West Twentieth St.; architects, Thom & Wilson.

Ave. B, *Nos.* 261, 263 *and* 265, 3 five-st'y brick tenements and stores, tin roofs; owner, Chas. Dearden, 327 Lafayette Ave., Brooklyn; architect, A. Spence.

East Twenty-sixth St., *Nos.* 231 *and* 233, 2 five-st'y brick and stone tenements, tin roofs; cost, each, $18,000; owner, Jacques Bach, 240 East Twenty-seventh St.; architect, Jobst Hoffmann.

East Forty-first St., *Nos.* 110, 112 *and* 114, 3 five-st'y brick tenements, tin roofs; cost, each, $19,000; owner and architect, Jobst Hoffman, 153 Fourth Ave.

One Hundred and Thirteenth St., n s, 150′ e Third Ave., one-st'y brick stable and feed-store, tin roof; cost, $6,000; owner, John Kenn, 2171 Third Ave.; architect, Chas. Kinkel.

One Hundred and Seventeenth St., s s, 373′ e Pleasant Ave., 2 five-st'y brick tenements, tin roofs; cost, each, $15,000; owner, James Sweeney, Third Ave., cor. Twentieth Sts.; architects, Ebeling & Heinicke.

Madison Ave., s e cor. One Hundred and Tenth St., six-st'y brick apartment-house, tin roof; cost, $15,000; owner, Mary Dwluelle, 1539 Park Ave.; architect, J. F. Burrows.

Seventy-sixth St., n s, 200′ w Ninth Ave., 6 four-st'y brown-stone front dwells., tin roofs; cost, each, $20,000; owners, John T. and James A. Farley, 402 West Seventy-third St.; architects, Thom & Wilson.

Manhattan St., *No.* 5, three-st'y brick store, tin roof; cost, $5,500; owner, Annie E. Brown, One Hundred and Fifty-second St., near Boulevard; architects, D. & J. Jardine.

Eighth Ave., n e cor. One Hundred and Twenty-sixth St., five-st'y brick tenement and store, tin roof; cost, $25,000; owner, Maria Theresa McCormick, 269 West One Hundred and Twenty-sixth St.; architect, Theo. E. Thomson; builder, Jas. H. Parker; masons, Lally & Chartrand.

Eighth Ave., s w cor. One Hundred and Thirty-third St., five-st'y brick tenement and store, tin roof; cost, $18,000; owner and builder, Peter McCormack, 420 East One Hundred and Fourteenth St.; architect, J. H. Valentine.

Eighth Ave., w s, 25′ s One Hundred and Thirty-third St., five-st'y brick tenement and store, tin roof; cost, $18,000; owner, builder and architect, same as last.

Eighth Ave., w s, 50′ s One Hundred and Thirty-third St., 2 five-st'y brick tenements and stores, tin roofs; cost, each, $18,000; owner, builder and architect, same as last.

One Hundred and Forty-fifth St., s s, 132′ e St. Nicholas Ave., 2 four-st'y brick tenements, tin roofs; cost, each, $10,000; owner, John B. Haskin, Fordham; architect and builder, A. B. Marshall.

One Hundred and Twenty-ninth St., n s, 200′ w Third Ave., one-st'y brick car-house, tin roof; cost, $5,000; owner, Third Ave. R. R. Co., office Sixty-fifth St. and Third Ave.

Third Ave., w s, 65′ n One Hundred and Fiftieth St., two-st'y frame stable, gravel roof; cost, $3,500; owner, Peter J. Zugner, Third Ave., near One Hundred and Sixty-eighth St.; architect, Adolph Pfeiffer; builders, Janson & Jaeger.

Thomas Ave., e s, 200′ s Kingsbridge Road, 2 two-st'y frame dwells., tin roofs; cost, each, $3,000; owner, John B. Haskin, Fordham; architect and builder, A. B. Marshall.

Hull Ave., e s, 100′ s Suburban St., 3 two-st'y frame dwells., shingle roofs; cost, each, $3,800; owner, Twenty-fourth Ward Real Estate Association, 111 Broadway; architect, E. A. Marsh; builders, E. J. Hedden & Son.

East One Hundred and Fifty-seventh St., *No.* 630, three-st'y frame tenement, tin roof; cost, $5,000; owner, Mary C. Muller, on premises; builder, Alexander Weir.

Third Ave., e s, 150′ s One Hundred and Fifty-sixth St., three-st'y frame tenement, tin roof; cost, $6,500; owner, Peter Herlich, Third Ave., cor. One Hundred and Fifty-sixth St.; architect, Adolph Pfeiffer.

Northern Terrace, n s, 500′ w Riverdale Ave., Twenty-fourth Ward, two-and-one-half-st'y frame dwell., tin and slate roof; cost, $4,300; owner, Wm. E. Thorn, Riverdale; architect and builder, Samuel L. Berrian.

Morris Ave., n s, 100′ n One Hundred and Thirty-eighth St., three-st'y brick dwell., tin roof; cost, $4,000; owner, M. Schmiderer, on premises; architect, Hugo Seller; builder, not selected.

ALTERATIONS. — *Sixth Ave.*, *No.* 408, raise top story three feet and a four-st'y brick extension, tin roof; cost, $4,000; owner, Mrs. Horace Stokes, Hoffman House; architect, L. H. Broome; builder, R. Chidwick.

Prince St., *No.* 181, one-st'y brick extension on rear, tin roof; cost, $4,000; owner, Anthony Reisert, on premises; builder, John Leslie.

Fifth Ave., *No.* 321, front and interior alterations; cost, $12,000; lessee, Edward Leissner; owner, Mrs. Elizabeth Underhill, Garrison, N. Y.

New Chambers St., *No.* 70, interior alterations, windows, etc.; cost, $4,000; owner, Augustus W. Cruikshank, 316 West Eighty-fourth St.; architect, R. S. Townsend; builder, R. Townsend.

One Hundred and Thirtieth St., n s, 100′ w Eleventh Ave., add one-st'y, iron columns, first st'y, cellar walls underpinned, etc.; cost, $12,000; owner, George H. H. Butler, 126 East Twenty-ninth St.; architect, G. B. Pelham.

East Eleventh St., *No.* 21, one-st'y and basement brick extension, tin roof; cost, about $5,000; owner, Henry E. Jones, 14 West Twenty-third St.; architect, D. Burgess; builders, D. & E. Herbert and E. Mills.

Third Ave., *No.* 2273, one-st'y brick extension, tin roof; cost, $3,275; owner, Wm. H. Jacobs, 255 West Thirty-fourth St.; architect, Jas. S. Wightman; builders, J. & W. C. Spears and W. Elderd.

Lexington Ave., n e cor. Forty-fourth St., three-st'y brick extension, tin roof, also fronts altered for stores; cost, $9,000; owner, Joseph J. Keenan, 165 West Forty-sixth St.; architect, C. Rentz.

Third Ave., *No.* 1332, five-st'y brick extension, tin roof; cost, $7,000; owner, Wm. Ray, on premises; architect, J. C. Burne; builder, not selected.

Second Ave., *No.* 1332, five-st'y brick extension, tin roof; cost, $7,000; owner, Wm. Ray, on premises; architect, J. C. Burne; builder, not selected.

West Sixteenth St., *No.* 232, add one st'y, also five-st'y brick extension, tin roof; cost, $7,500; owner, John Eggers, on premises; architect, E. Gruwe.

East Fifty-fourth St., *Nos.* 307 *and* 309, new store front, two new windows, fit up new offices in oak, shift stairs to rear; cost, $4,500; owner, S. B. Wortmann, 126 East Seventy-ninth St.; architect and builder, R. McArtney.

Delancey St., *No.* 166, raise attic to full story, new flat roof and new partitions; cost, $4,000; owners, Samuel Full, 226 East Fifty-third St., and Seligman Full, 312 East Fiftieth St.; architect, Richard Berger; builder, H. D. Powers.

One Hundred and Twenty-third St., s s, 186′ 4″ w Third Ave., three-st'y brick extension, tin roof; cost, $5,000; owner, Jere. Lyons, 21 East One Hundred and Twenty-seventh St.; architects, Babcock & McAvoy.

Seventh Ave., s e cor. Twenty-second St., one-st'y brick extension, tin roof; cost, $3,500; owner, Nicholas Wernet, 210 West Twenty-first St.; architects, Thom & Wilson.

One Hundred and Sixth St., s s, 263′ e First Ave., one-st'y brick extension, tin roof; cost, $4,500; owner, Lehman Levy, 322 East One Hundred and Sixteenth St.; architect, F. W. Klemt.

East Broadway, *No.* 169, repair damage by fire; cost, $3,000; owner, Herman Korn, 157 East Sixty-fifth St.; architect, J. B. Snook; builder, N. Smith.

Jane St., *Nos.* 164 *and* 166, raise two stories, new flat roof, take down and rebuild front wall and internal alterations; cost, $8,000; owners, Worthen & Aldrich; architect, M. Snedecker.

Broadway, *Nos.* 60 *and* 62 to be connected for the Consolidated Stock and Petroleum Board, from plans of Mr. Edward E. Raht.

Washington St., *No.* 201, raise building from five and five and one-half to seven stories, etc.; cost, $7,000; owner, Thomas R. McNeil, 199 Washington St.; architect, M. V. B. Ferdon; builder, James P. Niblo.

Warren St., *No.* 32, and along *Church St.*, to No. 102 Chambers St., raise one st'y; cost, $12,000; agent for owner, Spencer Aldrich, 93 Park Ave.; architect, Samuel A. Warner; builder, not selected.

West Twenty-fifth St., *Nos.* 544, 546 *and* 548, rebuild westerly, easterly, and part of rear walls; cost, $4,000; owner, Warren M. Merrill, on premises; builder, John G. McMurray.

West Sixth Ave., near Washington Pl., repair damage by fire; cost, $5,000; owner, St. Joseph's Roman Catholic Church, cor. Sixth Ave. and Washington Pl.; architect, Arthur Crooks; builder, Mr. Doyle.

West Thirty-sixth St., *Nos.* 533 *to* 541, five-st'y extension on westerly side, gravel roof; cost, $15,000; owners, Rohe & Bro., 334 and 350 West Thirty-third St.; architects, Thom & Wilson.

Fifth Ave., *No.* 204, one-st'y brick extension, tin roof, also internal alterations for business purposes; cost, $20,000; lessee, Wm. Schaus, 749 Broadway; architect, Geo. Martin Huss; builders, W. A. & F. E. Conover.

East Seventeenth St., *No.* 600, two-st'y brick extension, tin roof; cost, $3,000; owners, Koenig & Schuster, Greenwich St., cor. Harrison St.; architect, Julius Boekell.

Manhattan St., *No.* 4, through to One Hundred and Twenty-ninth St., three-st'y brick extension, tin roof; cost, $3,000; owner, Mrs. J. Romaine Brown; architects, D. & J. Jardine, 1262 Broadway.

Ninth Ave., n w cor. Seventy-eighth St., build new chimney-stacks, reconstruct fire-proof partitions, new boiler-room, etc.; cost, $100,000; owners, Milliken & Smith, 95 Liberty St.; architects, D. & J. Jardine.

East Forty-first St., *No.* 58, two-st'y brick extension, gravel roof; cost, $8,000; lessees, Hunting & Hammond, Park Ave. and Fortieth St.; architect, Stephen D. Hatch; builders, A. A. Andruss & Son and James Elgar.

Division St., *No.* 51, and *East Broadway*, *No.* 64, raise one st'y, to be altered internally, and made into two separate tenements; cost, $18,000; owner, Harris Cohen, 134 White St.; architect, E. W. Greis.

Essex St., *No.* 151, four-st'y brick extension, tin roof; cost, $3,000; owner, Margaret Hauselmann, 197 Third Ave.; architect, E. W. Greis.

Spring St., *No.* 307, raise two stories; cost, $3,000; owners, Henry and John Stemme, 13 Bowery; architect, Wm. Graul.

Monroe St., *No.* 244, raise attic to full story and a one-st'y extension, rebuild front and rear wall, alter basement to store; cost, $3,500; owner, Henry Cohen, 225 East Seventy-ninth St.; architect, C. Baxter.

East Twenty-ninth St., *No.* 318, raise one-st'y; cost, $4,500; owner, John H. Hankinson, 105 East Twenty-fifth St.; architects, Alf. Zucker & Co.; builder, not selected.

Eighth Ave., *No.* 838, one-st'y brick extension, tin roof, new store floor, put in iron girder and posts in first story; cost, $3,000; owner, Estate of Peter A. Hegeman, by Peter A. A. Hegeman, 150 Broadway; architect, John Sexton.

Thirteenth St., *No.* 432, five-st'y brick extension, tin roof, take out front wall in first story, and put in iron girder and columns, new show windows, etc.; cost, $13,000; owner, Geo. B. Dean, 277 West Eleventh St.; architect, G. W. Walters; builder, not selected.

The Burr Printing-House, 14 Jacob St., is to have a six-st'y fire-proof addition built, by Mr. Frank D. Harmon, from plans of Alfred H. Thorp.

Philadelphia.

FACTORY.—Walter H. Gessinger, architect, is to build for A. M. Collins Son & Co., at the cor. of American and Oxford Sts., a five-st'y brick factory, 120′ x 241′, together with other supplementary buildings.

BUILDING PERMITS.—*Annin St.*, *No.* 2129, two-st'y stable, 14′ x 28′; Andrew Hughes, owner.

Fifty-seventh St., n e cor. of Vine St., 2 two-st'y dwells., 14′ x 28′ and 16′ x 44′; Wells & Son, contractors.

Pear St., above Fairmount Ave., 2 two-st'y dwells., 13′ x 30′; Wm. Perrins, owner.

Gleason St., above Ridge Ave., two-st'y shop, 34′ x 31′; Chas. Wagner, owner.

Emerald St., above Huntingdon St., 2 two-st'y dwells., 14′ x 42′; Henry Foote, contractor.

Clifton St., cor. Alleghany Ave., three-st'y dwell., 13′ x 35′; Lewis J. Wolf, owner.

Federal St., *No.* 1024, three-st'y dwell., 18′ x 48′; Robert Thompson, contractor.

Second St., below Tioga St., 2 two-st'y dwells., 17′ x 48′; Jno. Trainor, contractor.

Lex St., below Silverton Ave., 6 two-st'y dwells., 14′ x 30′; E. C. Adams, contractor.

Hope St., below Cumberland St., two-st'y stable, 20′ x 30′; Wm. McFarland, contractor.

Twenty-second St., s e cor. Washington Ave., one-st'y foundries; Geo. C. Payne, contractor.

Turner St., below Venango St., 1 two-st'y dwells., 15′ x 30′; Abraham Ruble, contractor.

Whitney St., *No.* 715, three-st'y dwell., 18′ x 38′; Samuel Tudor, contractor.

Emerald St., cor. Franklin Ave., 17 two-st'y dwells., 15′ x 43′; J. R. Pyle, contractor.

Fifth St., above Tioga St., 2 two-st'y dwells., 17′ x 44′ and 16′ x 45′; Jas. H. Dorff, contractor.

Front St., below Dauphin St., two-st'y stable, 18′ x 24′; Geo. Kessler, contractor.

St. Louis.

BUILDING PERMITS.—Ninety-seven permits have been issued since our last report, fourteen of which are for unimportant frame houses. Those of the rest worth $2,500 and over are as follows:—

C. S. Crane, two-st'y frame dwell.; cost, $2,500.

W. G. McRee, two-st'y frame dwell.; cost, $15,000; J. B. Lindsley & Son, contractors.

Wm. Werner, two-st'y brick dwell.; cost, $3,200; A. Deitz, contractor.

T. Gartland, two-st'y brick dwell.; cost, $3,000; J. V. Mayors, architect; A. McAllister, contractor.

G. W. Pipe, 2 adjacent, two-st'y brick dwells.; cost, $5,000; G. W. Pipe, architect; G. W. Pipe, contractor.

D. L. Parrish, two-st'y brick dwells.; cost, $5,000; Grable & Weber, architects; B. F. Stadelmeyer, contractor.

H. Bier, two-st'y double brick tenement; cost, $3,500; P. Tiemann, contractor.

C. Kunst, 4 adjacent two-st'y brick tenements; cost, $7,994; Helm & Bro., contractors.

J. V. Sullivan, two-st'y brick dwell.; cost, $3,000; Th. Furlong, architect; M. B. Scanlan, contractor.

J. Halpin, addition to three-st'y store and tenement; cost, $4,500; McNamara, architect; O'Mallory & Bro., contractors.

P. Huhn, three-st'y store and tenement; cost, $5,000; C. F. May, architect; Biermann & Ahring, contractors.

Henry Huelsman, two-st'y store and tenement; cost, $4,000; C. F. May, architect; J. Yaeger, contractor.

G. R. Wilson, 6 adjacent two-st'y dwells.; cost, $20,000; S. C. Cairns, architect; sub-let.

A. Cooper, 5 adjacent two-st'y dwells.; cost, $25,000; H. E. Piper, architect; sub-let.

Mrs. M. L. Howard, two-st'y brick store and dwell.; cost, $2,500; Thos. W. Brady, architect, J. Wasling, contractor.

Geo. Mannbach, two-st'y brick dwell.; cost, $2,900; T. S. Green, contractor.

J. D. McAdaris, 2 three-st'y brick flats; cost, $30,000; G. I. Barnett & Son, architects; sub-let.

Mrs. Rittmann, two-st'y brick tenement; cost, $3,500; Wm. Paul, contractor.

Mr. Cook, two-st'y brick dwell.; cost, $2,500; Pat. Brennan, contractor.

Mr. Cook, two-st'y brick dwell.; cost, $2,500; Pat. Brennan, contractor.

A. Busch, three-st'y store and hall; cost, $14,000; H. Cameron, architect and contractor.

Mrs. W. Wartman, 3 adjacent two-st'y dwells.; cost, $6,500; H. C. Rocklage, contractor.

Henry W. Rocklage, 2 adjacent two-st'y dwells.; cost, $4,000; H. C. Rocklage, contractor.

H. Nicolaus, two-st'y brick dwell.; cost, $7,000; H. Franke, contractor.

J. A. Schultz, addition two-st'y dwell.; cost, $7,600; A. Wagner, contractor.

Miles Sells, three-st'y brick store and dwell.; cost, $16,000; Chas. E. Illsley, architect, Barnett & Duffner, contractors.

J. Barney, two-st'y brick dwell.; cost, $4,000; J. E. Newberry, contractor.

Wm. Nopte, two-st'y brick dwell.; cost, $3,500; B. J. Goesse, architect; F. Frankmann, contractor.

C. Luke, 3 adjacent two-st'y tenements; cost, $5,000; Rothe & Rattermann, contractors.

W. Cibulka, two-st'y brick dwell.; cost, $3,000; Klute & Hildebrand, contractors.

Wm. Luffel, 4 adjacent two-st'y dwells.; cost, $8,000; Klute & Hildebrand, contractors.

Wm. Fegelhoff, 4 adjacent two-st'y dwells.; cost, $3,500; Goesse & Remmers, contractors.

J. Pickel, two-st'y brick dwell.; cost, $3,000; B. J. Goesse, architect.

J. F. Brüggoman, two-st'y brick dwell.; cost, $3,500; Mr. Laue, contractor.

Mrs. E. Bakers, 2 adjacent two-st'y tenements; cost, $3,800; A. M. Baker, architect; sub-let.

W. C. Popp, two-st'y brick dwell.; cost, $4,500; Wm. Whri, architect; W. C. Popp, contractor.

J. Schimmelpling, 3 adjacent two-st'y brick dwells.; cost, $5,500; T. Mueller, contractor.

D. Welscher, 2 adjacent two-st'y brick dwells.; cost, $4,000; F. Mueller, contractor.

G. Geers, 2 adjacent two-st'y brick dwells.; cost, 4,000; F. Mueller, contractor.

Jas. O. Neil, 7 adjacent two-st'y dwells.; cost, $16,000; P. T. Meagher, architect; sub-let.

(*Continued in Supplement page 4.*)

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CONTENTS.

MOST of our readers know something of the unfortunate result of the competition for the Boston Public Library, in which, after offering very liberal prizes, the city failed to obtain a plan suitable for its purposes, not through any fault of the architects, but simply, to put in a few words the general conviction on the subject, because the terms of competition were drawn up without suitable advice. Since the award, therefore, which condemned the tax-payers of the city to pay ten thousand dollars for a few sheets of drawings embodying designs which their authors were compelled by their instructions to make impracticable and injudicious, there has been a good deal of curiosity, among the public quite as much as in the profession, to see what new steps would be taken for procuring proper plans for the building, which must be begun within a few months, under penalty of the forfeiture of the land granted by the State to the city as a site for it. The first of these steps, according to the Boston papers, has just been taken, in the shape of an order, passed by the municipal government, instructing the city architect, a young man who devotes his time to the city building work, to prepare plans for the library building, and submit them to the Trustees of the Library for approval. With all respect to the city architect, we cannot help thinking that the people of Boston would much prefer to have their costly library erected under the direction of some individual of greater distinction in the profession; and, although the terms of the ordinance do not prevent the Library Trustees from employing expert advice in considering whatever plans may be presented to them, it would, we are sure, be more satisfactory to them, as well as to the tax-payers, to have it distinctly understood that no plan would be approved or adopted without professional criticism. We take it that the citizens desire to have the best, most convenient, and beautiful building that their money will procure, and are not only willing, but anxious, to secure this by the only possible mode, that of employing the best architect who can be had to design it; and we imagine, moreover, that they think they have thrown away enough money in trying to dodge this conclusion, and would be glad to see an end of amateur tinkering with the most important building project that the city has undertaken for many years.

THE pressure for the removal of the present architect of the Capitol, Mr. Edward Clark, and the substitution of some politician, still continues, although no reason whatever has yet been given for displacing a man admirably qualified for his duties, who has been professionally connected with the Capitol for thirty-four years, and knows nearly every stone in it, to make a place for some dilapidated party hack. For persons unfamiliar with Washington a little reflection is necessary to understand the importance of such an office as that which Mr. Clark now fills. Perhaps no public building in the world is harder "worked," to use an expressive phrase; and alterations, refittings and repairs are continually going on. To carry these out satisfactorily and economically, or to devise modes of satisfying new wants, such as every year develops, a thorough acquaintance with the fabric is absolutely necessary, and the tinkering of a novice might easily result in irremediable mischief. Unlike many of our public buildings, the Washington Capitol, partly through the skill of Mr. Clark himself, who acted as assistant to the architects of the wings which form the most important portion, is a work of art which may safely challenge comparison with any architectural object in the world, and it would be a misfortune to the whole country to have that discretion which has saved the pure and noble beauty of our principal building from so many dangers exchanged for the guardianship of a man who, however devoted and skilful he might be, must inevitably lack the special tastes and training which have so admirably fitted Mr. Clark for his position.

THE Finance Committee chosen to raise funds to build the pedestal for the great statue of Liberty has at last made a direct appeal to the people of New York to contribute money enough to complete the work at once. Practically, as would seem from the address, the efforts made to raise money in other parts of the country have failed, less than ten per cent of the whole amount subscribed having been received from places outside of New York city and its immediate vicinity, while, as we imagine, the cost of soliciting and receiving these outside subscriptions must have subtracted greatly from the net proceeds. The last appeal is, therefore, very sensibly made to the people of New York alone, and local pride, at last awakened, ought to be sufficient to insure a liberal response to it. From all we can learn, it seems to us that the committee took the responsibility of beginning an unnecessarily costly pedestal for the statue, and it will perhaps deserve a little blame for want of prudence if it should be unable to find resources for carrying out its project, but this is a contingency which, in view of the wealth and real generosity of the New Yorkers, we hope it is not necessary to contemplate.

A RATHER knotty question is likely to come up for judicial decision in New York, and architects who have occasion to plan or construct buildings for jewellers will do well to note the case. Six years ago Mr. Isaacsen, the owner of a building in that city, rented his second floor to a manufacturing jeweller. Some months ago, a man who makes a business of collecting jewellers' sweepings and reducing them for the gold and silver contained in them, came to Mr. Isaacsen, and told him that whenever his second-story tenant moved out he would buy the floor of the rooms which he had occupied, replacing it with a new floor, and paying the landlord a hundred and fifty dollars in cash besides. Mr. Isaacsen kept this offer in mind, and when his tenant notified him, a few weeks ago, that he intended to give up the rooms and move away, assuring him, however, that he would put in a nice new floor before he left, the landlord not only begged him not to take so much trouble, but even forbade him to change or interfere with his floor in any way, threatening to obtain an injunction from the court to enforce his admonition, and finally applying to a lawyer, who served notice on the tenant that the floor was a part of the landlord's building, and must not be disturbed. The jeweller, however, who was quite aware of the value of the dust which had fallen on the floor, disregarded all these threats, and, after removing his machinery, took up all the old boards, sweeping them carefully, and collecting the dust which had fallen between them into the hollow spaces beneath, and finally replaced them by new ones, and sent the old boards and the dust to the smelter, who, as he anticipates, will return him several hundred dollars as the value of the precious metals extracted from them. Meanwhile the landlord, who seems to have something of law, as distinguished from justice, on his side, threatens his tenant with legal proceedings, which we hope, for the sake of seeing so interesting a question decided, will not be long delayed.

A CURIOUS instance of the manners prevalent in the newspaper world of New York, where a disgusting venality is, it would appear, supposed to be the principal influence under which newspaper men act, is to be found in a recent discussion about the street excavations to be undertaken during the approaching spring and summer. It seems that an order was passed there some time ago, requiring the wires of a certain telegraph company to be placed underground within a given

period. The company has postponed compliance with the law until now a few months only remain of the specified period. Among the city newspapers is one which is supposed to be owned by a prominent holder of stock in the telegraph company, and no sooner did the last part of the term approach for laying the wires underground, than this same journal began a series of articles in the interest of the public health, explaining the dangers of excavating the filthy streets of the city during the hot weather, and pointing out the propriety of having such work, if once begun, stopped by the Board of Health. The writer of the articles fortifies his opinion by that of many eminent physicians, and there is no doubt that his apprehensions are in part justified, any extensive excavation, even in the middle of the city, having notoriously been followed by an epidemic of malarial diseases in the vicinity, while his theory that cholera is likely to be invited by disturbing the streets in hot weather, although a rather doubtful one, seems to have a certain basis of fact. Unfortunately, all these warnings and citations are made the subject of great mirth on the part of another newspaper, which openly attributes them to the desire of the proprietor of the former one to save himself, by misleading public opinion, the expense of laying his telegraph wires beneath the surface, and the degrading duel between what the respective parties to it would have us believe to be unctuous hypocrisy and sneering malice, goes on day after day, to the entertainment, perhaps, of the vicious, but to the deep disgust of the rest of the world.

THE bill providing for the appropriation of the land about Niagara Falls as a public park has passed the New York Legislature, and there is now no doubt that the contemplated improvements will be made. These will consist mainly in sweeping away the mills which have clustered about the rapids above the Falls, and in abolishing the provoking enclosures which cut off access to the river except in certain places, the State for this purpose acquiring the title to the whole of the river bank for some distance above and below the Falls. If the action of the New York Legislature should be followed by corresponding action on the part of the Canadian Government, as is quite probable, the great cataract will once more become one of the most attractive resorts in the world. The cost to the State of taking and improving the river bank will not be great, and is to be distributed over the next ten years by the issue of bonds, so that the contribution which the average tax-payer will have to make toward the good work will be very small in proportion to the satisfaction which he will feel in having it accomplished.

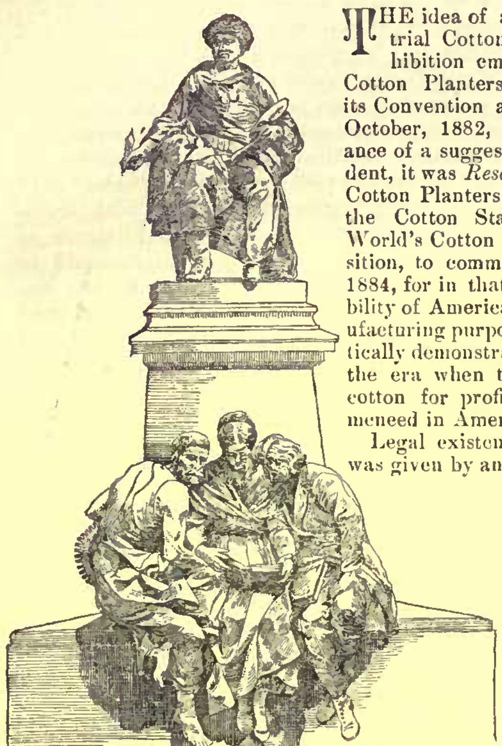
AN interesting exhibition is projected for the coming autumn, to be held in Philadephia, under the auspices of the Franklin Institute, whose management of the Electrical Exhibition was so successful. The new exhibition is to be composed exclusively of novelties, and is to take its name from them, nothing being admitted except devices sufficiently recent to be new to the majority of visitors. In this age of inventions, there is no danger that the space will not be fully occupied, and the idea of limiting the exhibits to things which will be new to those who see them is a very happy one. The most serious question in the administration of such affairs is always to determine what to exclude, and if everything were excluded with which the general public were already familiar, the cream of most exhibitions would still remain, of all the better quality for not being diluted with uninteresting matter. The exhibition opens September 15, and continues a little more than six weeks, the last day being October 31.

THE Trustees of the Boston Museum of Fine Arts, an institution which, though very quietly managed, is gradually getting together a collection, or rather a series of collections, of very great interest and value, have recently published their ninth annual report. As is almost inevitable during the first decade of the life of such a museum, unless sustained by the public treasury, the ordinary receipts of money have fallen far short of the necessary expenses, but it is a satisfaction to know that more than one hundred and sixty-eight thousand persons have passed through the registering wickets, and have carried back with them, we venture to say, ideas which they will some time be glad to have acquired. During the past year the Museum has been so fortunate as to receive from the Archæological Institute of America the gift of the whole series of Greek antiquities obtained at Assos by the expedition under Messrs. Clarke and Bacon, comprising one hundred and fifty-six sculptured or inscribed pieces of marble or other stone, three hundred and forty pieces of pottery, twenty-seven of glass, three of gold, fifty-seven of other metals, and eight hundred and fifty-one coins. Considering that these are all from one of the most isolated and purely Greek towns of Asia Minor, the Museum is to be congratulated upon its possession of this collection, which for interest to scholars and archæologists is unrivaled on this side of the Atlantic. Besides the Assos sculptures, the Museum has received during the past year, unfortunately only as a loan, two noble Etruscan sarcophagi covered with sculpture of great force and dignity, which students of architecture, as well as of sculpture, who may have the opportunity, would do well to examine attentively, for their artistic as well as their historical interest. In the way of paintings, the Museum has been so fortunate as to be able to show through the whole or a part of the year both Regnault's Automedon and Bastien-Lepage's Jeanne d'Arc, two of the most renowned pictures which the modern French school has produced; and has acquired, by bequest from the late Thomas G. Appleton, one of its most devoted friends, three Troyon pictures, besides one by Constable, and a sketch by Tintoretto.

THE author of most of the novelties which made the Madison Square Theatre, in New York, so interesting, has introduced more of the same kind in the new Lyceum Theatre, in the same city, now in the hands of the decorators. The most conspicuous peculiarity about the theatre is, perhaps, the movable orchestra-pen, or rather pavilion, which is an ornamental structure extending across the whole proscenium opening, level with the stage, so that this, with everything on it, is concealed as effectually as by a curtain. While the setting of the stage is going on, the orchestra, multiplied by mirrors in the back of the pavilion, entertains the audience with the usual appropriate music; but when all is ready, and the prompter gives the signal, two curtains suddenly sweep across the front of the pavilion, and crossing each other, loop themselves up again at the sides of the proscenium opening. At the moment of crossing, the pavilion concealed behind them disappears, hoisted up among the "sky borders" by elevator machinery, and the curtains as they loop themselves up disclose the stage and the performers in the opening tableaux. How the orchestra, suspended in the flies during the acts, manages to express with propriety the agonies of the heroine on the stage, we are not informed, but this should not be a matter of much difficulty. Another novelty, not of a strictly architectural character, is said to be the form of the programmes in the new theatre. In place of coarsely printed and ungrammatical advertising broadsides, as they are in most theatres, or the pretty little cards of the Madison Square Theatre, the Lyceum programmes are to present the appearance of small ornamental batons about the size of a large lead pencil. Inside of the baton is a coiled spring, like that which is used to operate window shades, and the programme, printed on cloth, is coiled by means of the spring inside the little stick. If the owner wishes to consult it, he has only to pull a ring or knot of ribbon provided for the purpose, and draw out as much of the programme as may be necessary, letting it slip back into its case when he has read as much as he wishes.

WE are glad to see public attention called, by the testimony of the Chief of the Chicago Fire Department, in the inquest over the burning of the Langham Hotel, to the danger attending the placing of frames covered with telegraph wires on the roofs of buildings. In his opinion, as reported in the *Firemen's Journal*, the fall of the wall of the hotel, which took place in an incredibly short time after the breaking-out of the fire, and caused the death of several persons, was caused by the strain upon a frame standing on the roof, and supporting about forty telegraph and telephone wires. Although the telegraph companies deny the possibility of this, we are decidedly inclined to think that the Chief of the Fire Department is right. We have ourselves known a chimney to be pulled over by the wires which were attached to it at an angle, and have no doubt that similar accidents are much more common than they should be; and the unequal strain upon the walls of a building carrying a large number of wires must inevitably be felt in some way when the support of the floor-beams is weakened or destroyed by fire.

THE COTTON CENTENNIAL EXHIBITION AT NEW ORLEANS.



Monument to Dumas, Paris. Gustave Doré, Sculp.

THE idea of a World's Industrial Cotton Centennial Exhibition emanated from the Cotton Planters' Association at its Convention at Little Point in October, 1882, where in pursuance of a suggestion of the President, it was *Resolved:* "That the Cotton Planters and Farmers of the Cotton States do have a World's Cotton Centennial Exposition, to commence in the year 1884, for in that year the availability of American cotton for manufacturing purposes was first practically demonstrated, and it marks the era when the cultivation of cotton for profit was first commenced in America."

Legal existence to the scheme was given by an Act of Congress, approved by President Arthur, February 10, 1883, of which the following is the preamble.

"Whereas, It is desirable to encourage for celebration the one hundredth anniversary of the production, manufacture and commerce of cotton, by holding in the year one thousand eight hundred and eighty-four, in some city of the Union — to be selected by the Executive Committee of the National Cotton Planters' Association of America, an institution for the public welfare, incorporated under the laws of Mississippi — a World's Industrial and Cotton Centennial Exposition, to be held under the joint auspices of the United States, the said National Cotton Planters' Association of America, and of the city in which it may be located, and in which cotton in all its conditions of culture and manufacture will be the chief exhibit, but which is designed also to include all arts, manufactures and products of the soil and mine. . . ."

The President at the meeting of the Cotton Planters' Association hereinbefore mentioned, was instructed to correspond with various cities of the States in order to ascertain the one which could offer the greatest inducements for its location. When the correspondence was received in reply to the President's communication it immediately became apparent how great the competition was between the various cities. However, the award of location was finally made to New Orleans, upon the assurance and pledge that a sum of $500,000 would be subscribed in that city.

This was done notwithstanding a very strong report made antagonistic to the selection by the President of the Cotton Exchange of New Orleans, and adopted by that institution: it is fair to mention this, because of the coolness of New Orleans towards the Exhibition is partly explained by it. In this same report it is estimated that $2,000,000 would be required to properly conduct a World's Industrial Cotton Centennial Exhibition, a calculation which turns out to be pretty correct, though it was imagined at the time that a capital of $500,000 would be sufficient.

For the site of the Exhibition Building, the management chose a tract of land known as the Upper City Park; the six miles distance from the city being, so to speak, compensated for by its vicinity to the Mississippi River, and by its capabilities for being converted into a handsome park with beautiful pleasure gardens.

Some time in the latter part of 1883, the Board of Management called for competitive drawings for a "World's Industrial Cotton Centennial Exhibition" building, and offering various premiums. It was stipulated that the building should have a million feet of floor space for exhibitors' use, exclusive of necessary offices for management, and the whole was not to cost more than a quarter of a million, or $250,000. Architects of reputation and standing naturally stood out of the competition, knowing how perfectly useless it would be to attempt to gain any architectural effect, or add laurels to their reputation, by designing a building which must either be a barn, or far exceed the proposed outlay. A cotemporary, however, which lies open beside me, refutes the above, stating: "Many were the architectural artists who essayed the solution of the problem, but it was not for a famous architect of some great far-away city to submit the plan that took the prize, but a man [a Swede] whose home was in a Mississippi town." However this may be, Mississippi must acknowledge that though she gives the architect a home, he brought to it from the land of his birth all he knows of his profession.

The result which he actually demonstrated was, the impossibility of erecting even a barn, and finishing it ever so poorly, for the small sum stipulated.

Early in March, 1884, the enormous building was commenced, without having previously provided steam communication with the city, or building a wharf with suitable approaches to the site of the Exhibition, by which water-carriage would have been made available. Some time in July difficulties arose, funds were exhausted, and the subscriptions promised were not forthcoming. The head, middle and bottom of the whole, Major E. A. Burke, Director General, proceeded to Washington, and met with unwonted success; a million dollars was voted for the affair. Upon receipt of the news, despair of completing even the main building properly (which never yet has been done), gave way to a species of madness which appears to have seized the management. First it was deemed necessary to build a special house for the Government and State's Exhibits, then an art hall, then a building for the exhibition of the process of sawing logs of timber, another for showing the manufacture of bricks. *En passant* let the reader here be informed that the manufacturers of bricks were, and are still indignant at not having had space in the main building, protesting that the art of brick making, descended from the era of the Pharoahs, may now be conducted in a drawing-room without detriment to its contents or carpet. Even the vast extent granted to machinery was now found not to be sufficient, and a huge iron barn, built out of remains of the Philadelphia Exhibition, was added to the main building, projecting like some horrible excrescence to give additional space for the never ending Olivers asking for "more."

An exhibition on such a scale should never have been contemplated by an impoverished city, far away from the centre of population. Had the original idea as promulgated by the President and Cotton Planters' Association been carried out, namely a Cotton Centennial Exhibition, at which the industries of the cotton-growing sections of the United States, might have been witnessed, and an opportunity given for the cotton planters of the South to show the world what they could do, and what progress they had made, then the results would have been of a very different kind.

Now there is a barn, or rather a series of barns, crammed full with "fakirs" selling pretended products of countries, which the articles thus sold have never even seen, interspersed here and there with some piece of machinery, interesting, and well worth examining, or beautiful display of some valuable and artistic household commodities, from which one's attention is immediately drawn by cries of "A stagnant drop of water, see what it contains!" "Try your weight, sir, only five cents!" "Have your silhouette, sir, only twenty cents."

The building in itself is no doubt a success, and had it been finished as intended would have been a grand one, but (and how much lies behind that little word) it is not nor ever will be finished, and it is and always will be a huge barn. The general arrangement and proportions are tolerable, but are spoiled by being enclosed in a ginger-bread attempt to make an Italian Renaissance out of matched and beaded sideing and galvanized-iron, elaborately ornamented [?] with mock towers and sham roofs. These latter would certainly have proved less an eye-sore had some judgment been exercised in returning the sides sufficiently to impress the spectator with the idea that they were solid. The result calls to mind the effect of looking behind the scenes at a theatre, when all the beautiful solidity of masonry disappears, and is replaced by dirty canvass and very small scantlings.

The main building is approached, after a most tedious ride from the city (a crushing objection to the prosperity of the fair), by a long sweeping curve, designed apparently to spoil the only chance of a view of the façade of the neighboring Government or State's Exhibit Building. Regarding the main entrance, little can be said, except that from it the state of the whole buildings may be arrived at, viz., that they are unfinished, and architecturally speaking decidedly poor.

Having entered, the vastness of the structure strikes the spectator, and its want of relief is immediately apparent. Where are the needful projections to produce even a small effect of shadow? Nothing but three great semi-circular openings with a profound shadow. Montesqeiu has it, "Ornaments fatigue by their littleness, and are sometimes so confused that no part can be distinguished from another." A celebrated architect, now long since dead, on being asked what he thought of Paris, replied, "It is a pudding all made of plums." Here on this main front there is not only a painful lack of ornament, but entire want of shadow. The eye searches in vain for a change from the perpetual up and down, and horizontal lines, which, as one stands in the centre, seem to continue indefinitely on either side into space. The same objections apply to both sides. However, the eye seeking wearily for something to fill it, naturally rests on a piece of statuary colored to imitate bronze, which stands immediately over the main entrance in a recess about one-third too small for it; and one is astonished at the painful foreshortening of the whole group, until upon closer examination it turns out to be a wonderfully good copy of the "America" which stands at one of the four corners of the Albert Memorial, Hyde Park, London. This copy is wonderfully good and exact, but the manufacturers have to thank the architect for placing so good a work of art, intended to be on a level with the spectator's eye, at an elevation of over 40 feet, thus mangling every detail by the inevitable foreshortening.

A few general items, taken from the publications of the management, may here prove of value. "The main building is the largest ever

erected. It is 1378 feet long by 905 feet wide, without courts, and has a continuous roof composed largely of glass, so as to afford an abundance of light without subjecting the interior to the direct rays of the sun. Within the view is unobstructed. From one side or corner of the building to its opposite, the interior showing all phases of industrial activity is seen. There are no partitions, and the lofty pillars wide apart, supporting the roof structure, present no impediment to one's vision, but only serve to assist the eye in measuring the vast expanse. The interior is surrounded by wide and spacious galleries, 22 feet high, which are reached by twenty elevators [1] having the most approved safety appliances, and by convenient stairways.

"The machinery department occupies a space of 1378 feet long by 350 feet wide, within the main building, and has an extension added in iron 320 feet long, and 150 feet wide [it is 120 feet], for heavy machinery, described under the heading of Cotton Annex.

"The main building contains general exhibits. It is situated about in the centre of the park. The plan of the main building is arranged in a series of sections. In the centre we have the Music Hall, with galleries round both sides, and at rear, access being gained to them by a stairway right and left of entrance to hall. Starting from right, we have the same on left; we have four bays or sections of 20 feet span each, the two inner ones are carried up sufficiently high from the other two to admit of sashes being placed for light. We have then a series of spans, viz.: 37 feet 6 inches, 50 feet, 75 feet, 50 feet, 37 feet 6 inches, and 20 feet; and then the same repeated, viz.: 37 feet 6 inches, 50 feet, 75 feet, 50 feet, and then the galleries, with a width of 37 feet 6 inches, with a row of posts in centre. Starting lengthways we have the galleries, which run round the whole building, at 50 feet, at 75 feet, 50 feet spans then the whole length of Music Hall with gallery, and then same repeated in rear, viz.: 50 feet, 75 feet and 50 feet spans, 37 feet 6 inches gallery, then four sections of 20 feet span each."

Concerning the outside a few general remarks must suffice, although pages might be filled with criticisms of an unfavorable character. Looking up at the tower, the question arises, What are those holes cut through the very roof, and lessening the appearance of the already weak mansard construction? They are to allow the sounds of the bells (a remarkably fine peel, by-the-by) to escape, but surely for the sake of professional dignity and reputation it would have been worth the architect's while to have repeated the belfry opening he has placed on one side, though it were done at his own expense; or using his professional powers, he might have induced the management to have built a small belfry somewhere, which would have proved an addition of great value to so long a stretch of straight lines. There is on this tower an ugly excrescence which looks like a smoke-shaft, but turns out to be the roof of an elevator. In regard to the detail of the outside, one most important point is taught, namely, that it is not safe to use green siding rebated and beaded with a vertical joint. The whole of this structure had to have the joints covered with laths on the inside to keep out the weather, and this only a few weeks after the siding had been placed in position.

The double parapet has a very inartistic effect, to the eye brought up surrounded by the best examples of Renaissance style.

The bottom moulding (that is plinth) of the pilasters, which are supposed to carry the cornice in front, is made to project over the pedestal; an original idea to throw off the rain. What would a Palladio say to this? The architect evidently makes a free interpretation of the author, who speaking of an architect's duty says: "It is to explore the treasures with which the vestiges of antiquity and the best works abound, viewing them not as documents and patterns merely, but as invaluable manifestations of mind in which may be read the very thoughts of their authors, and where may be found the reasonings upon which they acted, thence deducing principles and rules for controlling and directing those exuberances of fancy with which he who hopes to become a great architect should be gifted." The architect now under notice must have neglected to put a curb on his exuberances.

The effect of the outside coloring is extremely sad and timid; thus an opportunity has been lost of making up somewhat for the want of light and shadow. The color, a mixed salmon and white, is decidedly weak, and renders the long horizontal lines of the cornices more conspicuous than ever. The flags, of which there are a good number, give bright bits of color to an otherwise cold, coarse front. Had they been the proper size, they would have proved still more effective. The balusters surrounding the flagstaffs, although of the ordinary stone shape, are cut out flat, losing thereby all the charming effects of the shadows of the rounded ones; but luckily they are a long way off. The architect might surely have arranged matters with the Chief of the Fire Department, so that the ugly fire-patrol barrels for water might be placed where they could not be seen, instead of parading them in the centre and flush with the eaves of the roof.

An impression once formed is difficult to get rid of, and it must be admitted that no matter what was to become of the minor entrances, the main one should have been finished; the rafters ought to have been ceiled and a coat of whitewash given to the trusses where they are exposed. This would have done wonders; in fact it is not too late to do it yet, and the cost would be amply repaid by the effect.

Entering through swing doors badly hung on weak springs, which are already yielding to the little use they have had, upholstered in the gloomiest of all colors, black, which is nailed by bright tacks, thus increasing the sepulchral effect; passing under the galleries, one passes on to the centre of the seventy-five foot span, and here is the only chance of a vista right and left, clear down to either side. The immensity of the structure is visible, but is decidedly spoiled by the narrowness of the aisles, only some fourteen or sixteen feet wide. This one aisle should have been left entirely clear, with perhaps some few groups of statuary, not high enough to spoil the view, and maybe a fountain or two, with seats on either side, which would have formed a promenade and general rendezvous. The band could sometimes have played here. Then every visitor would have been struck with the size and importance of the Exhibition. Going still farther forward, one enters the music-hall, the masterpiece of the whole building, the proportions and construction of which atone somewhat for its bare and unfinished state.

The width of the hall is 50 feet in the clear, that is to the galleries, which are 32 feet in width, and which run down either side and are continued round rear of organ-chamber. There are fourteen arches, 20 feet apart, constructed of two thicknesses made up of one-inch plank, eight inches wide, of which there are ten in number. These are securely nailed, and of course so that each breaks joint; the two thicknesses are then securely bolted together with a clear width of 3 feet 6 inches between them, by one-inch wrought-iron bolts, with diagonal and horizontal braces, out of 4″ x 4″ stuff, at a height of 22 feet from the floor; the same construction is carried down, but straight. The foot is securely braced by a framed support, or what might be called buttress, spreading out at the bottom fifteen feet and bolted through the whole distance with iron bolts. Thus the height to the top of arch is 72 feet. On the top is placed a skylight with side-lights; the skylight is glazed with amber, red and blue colored glass, which has a very pleasing effect. About half-way up the arch there is another row of sashes, so that the hall is admirably lighted, though it is at its best at night, when it is lighted up with innumerable incandescent lights, which give a warm glow to the whole.

It may prove interesting to know that each of these arches were framed complete, and were hoisted into position by two derricks and two cranes, the latter being on the gallery-floor level, and the power used is manual.

At the end of this hall is a raised platform, with room to seat six hundred musicians and singers, and at rear of this is an organ-chamber, which is now filled by a handsomely decorated organ of chaste design, the advent of which has proved a great boon to visitors, supplying the want of music, which on some occasions has proved such a drawback.

This is the largest hall in America, and the architect and his assistants may be well proud of it. The only blemish is that from the greenness of the lumber used, all the arches have broken-backs. This is only apparent to the professionally critical eye, and might be hidden by the judicious introduction of drapery.

With the music-hall ends even the constructional cleverness of this famous structure covering over thirty-three acres. Alas, no longer does symmetry or regularity prevail. Posts requiring braces, and extra posts requiring iron tie-rods proclaim to the practical eye the advent of weakness. Here at one angle are three posts strapped together, and at the other three angles only one. Here we find a fourteen-inch and next to it a twelve-inch or even an eight-inch post. Where there should be one there are two, and why? If the post in one case be sufficient to carry the weight, it surely should be in the other. If the fault was in the lumber, why not have taken the defaulter out and replaced it?

The lighting of the interior, which is entirely by sky and side lights, is as nearly perfect as can be, and the architect was wise in introducing the panels of sheathing between the lights, as it relieves the eye from what would otherwise have been a continuous glare.

The construction of the roof is very simple and strong, though the braces under the tie-beam of a framed truss seem to be unnecessary and liable to fall. The roof is very similar to the roof of the St. Louis Exhibition, the foot of the principal being here as there raised some five feet from tie-beam.

The following is an approximate list of materials used in the main building:—9,809,500 feet of lumber; 312,200 feet of glass; 301,600 pounds of nails; 226,356 pounds of wrought-iron; 36,920 pounds of cast-iron.

An interesting item is the following: that the whole of this huge edifice was finished and fit for exhibitors ten months after its commencement, and this where the difficulties of transportation were almost unsurpassable, and where mechanics and laborers are not celebrated for an exuberance of energy.

In conclusion let the poet speak:—

> "Rude is this edifice, and thou hast seen
> Buildings, albeit rude, that have maintained
> Proportions more harmonious, and approached
> To somewhat of a closer friendship
> With the ideal grace. Yet as it is,
> Do take it in good part. Alas! the poor
> Vitruvius of our village had no help
> From the great city."

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[1] Out of the twenty elevators as far as can be ascertained, only one or two have ever been used. The rush of spectators to the galleries never having been so great as the management looked forward to.

THE DELLA ROBBIAS.[1] — III.



Medallion by Andrea Della Robbia from the Hospital of the Innocents, Florence. (From *L'Art.*)

I have tried to explain the essential quality of Luca Della Robbia's art, and now must speak as briefly as possible of its technical character as shown in one or two representative examples.

More even than other sculptors of his time, Luca preferred the relief to the statue in the round, and while they usually loved all its varieties with equal affection, he seems to have confined himself to a single one. We can imagine no kind of relief that was not brought to technical perfection early in the fifteenth century — none from the very highest to the very lowest. "High-relief," I may explain, implies that certain portions of the figures are entirely freed from the ground, are in fact worked in the round. When this is not the case, but when the most prominent portions are shown in more than half their thickness, then we speak of "middle relief," and anything flatter than this is "low-relief." For low-relief the Italian Renaissance sculptors had a peculiar liking, and that extreme variety which is called *bassissimo-relievo* was in truth an invention of their own. This variety has so slight a projection that the theme does not so much seem to be carved out of the material as to be an efflorescence, nay, an exhalation from the surface; yet within its delicate salience all the necessary modelling is done with exquisite perfection. Neither Greek nor mediævalist had used this *bassissimo-relievo;* no one but the Assyrian had employed it in its pure form, uncombined with any more prominent passages, and unhelped (as was the low-relief of Egypt, by either deeply-incised lines or a sunken field. And from Assyria had come, of course, no lesson to the Italians of the Renaissance.

If we look at the cella frieze of the Parthenon, we see middle-relief; if at its metopes, high-relief, and we find that in each case the chosen plane is used by itself and without admixture. But if we look at Italian reliefs, we find very often that more than one plane is used in a single composition. When we speak of the use of a single plane, be it understood, we do not mean that all the figures represented are given of necessity an equal degree of salience; but we do mean that there is only a very small difference in their relative distances from our eye; that the background of stone or bronze is confessed as such; that no perspective effect is desired; in a word, that the group is conceived as a piece of sculpture, partly disengaged from the block, instead of wholly disengaged as in work executed in the round. By the use of more than one plane we mean, on the other hand, that some conspicuous degree of distance separates the nearest from the remoter figures; that all do not form a single group; that the background is nowhere left as mere palpable material; that perspective effects are aimed at throughout; in a word, that the relief is conceived not as a true piece of sculpture, but as a more or less fully developed picture. Its figures decrease in size with their recession from the eye, as is the case on canvas; landscape or architectural details fill up the background and explain the composition, while for the ever-lessening intensity of color and sharpness of outline with which a painter completes his perspective illusion, are substituted different planes of relief and different degrees of definiteness in modelling. This is the system so largely employed by Renaissance sculptors, a system some tentative approach toward which had been made by the Assyrians, for example, and by the Romans, but which had never before been carried to its utmost possible limits. We hardly wonder that it tempted these fifteenth-century Italians, their love of realism was so strong, and their genius, as compared with the purely plastic genius of the Greeks, was so essentially pictorial.

To see the utmost limits to which it might be pushed, we have only to look at Ghiberti's later and more famous baptistery doors. We do not even try to count and distinguish the planes of his relief; they pass one into another by so many and such insensible gradations. We almost forget, indeed, that we are looking at sculptured work, so truly pictorial is the aim and the result. Yet almost in spite of himself, as it were, Ghiberti remains a great sculptor through it all, so great a sculptor that we can hardly bring ourselves to say that he sinned in overpassing the true limits of his art — so great that he tempts us to throw all theories to the wind and say: Let each artist be a law unto himself. But it is only artists as great as he who may permit themselves such liberty, and then, superb though their own results may be, their example is sure to be pernicious: a remark which is just as true of Ghiberti as it is of Michael Angelo. When lesser men work after the pattern he had set, then we begin to see its faults, then we begin to see how difficult it is, except for a Ghiberti, to realize any high artistic excellence when trying in sculpture for those qualities which are the province of the brush; to preserve charm of line and modelling, clearness of intention, balance, coherence and harmony of parts, and unity of effect, while securing — and this in a necessarily imperfect way — the charms of varied grouping and the illusions of perspective.

It must be counted as great praise for Luca Della Robbia when I say that, strongly though he felt Ghiberti's influence in other ways, he was never tempted by his example beyond a truly sculpturesque treatment of his reliefs. I think I am right in believing that he never used more than one plane at once, and I know I am right in affirming as much of all his most characteristic and most famous works. He always had a plastic, not a pictorial ideal in view, and, moreover, almost always that sort of a plastic ideal which is peculiarly the ideal of the relief; that is to say, which reckons upon the help of light and shadow for an important part of beauty. Strangely enough, Messrs. Molinier and Cavallucci speak throughout of his work as being bas-relief. In truth his chosen style was high-relief, and, so far as I have seen, he never used a really low variety.

The famous organ-tribune is in very high relief, admirably managed for charm of line, for balance of parts, for clearness of form, for play of light and shadow, and for all the variety in composition which can possibly be wrought with the legitimate use of a single plane, and it is finished throughout with an exquisite nicety which yet does not injure breadth and unity of effect. Placed near the eye as its slabs now are in the Florentine Museum, and considered, so to say, intrinsically, their handling delights us much more than the bolder, sketchier treatment of Donatello's corresponding series. But if they were all in their true position, in a darker place and well above our heads, it is possible that Donatello's would prove him to have been the wiser workman; but there is no other comparison to be made between the two series which does not most unquestionably redound to Luca's credit. Their themes are quite alike: groups of children varying in age from infancy to adolescence, who are singing and playing on many instruments, and sometimes dancing to the sound. Donatello's are admirably faithful, vigorous and delightful transcripts from Nature, but they are little else. Luca's are just as faithful — his figures are just as simply childlike, just as spontaneous in movement, just as diversely individual — but their realism is more reticent in expression, and is joined both to great plastic beauty and to a strong, genuine and appropriate sentiment. There is no token in Donatello's children that they are making sacred music; but no one can look at Luca's and mistake the fact. Devotional feeling is clearly expressed throughout, though varied with exquisite subtlety in accord with the age, the occupation and the individuality of each little figure. Its highest expression is in the group of older boys who are singing, quietly absorbed in their task, as they look over each other's shoulder at their book. But it is not lacking even in those groups which are in the strongest contrast with this — those where little children are dancing in a joyful, almost thoughtless mood.

The first-named group shows, perhaps, some slight lingering trace of the Gothic manner of the preceding century. It is a little monotonous, although very noble in line, and the delightfully *naïf* realism of its faces is gained by some slight sacrifice of beauty. But in many of the other groups we find the purest plastic perfection: a truly classic freedom and grace of movement, and a truly classic charm of physical type. Great is the difference, I think, between them and Donatello's reliefs. These last are very true, very fresh, and in their way very delightful; but they do not show us complete purity of line, perfection of form, or a finely-balanced harmony in composition. In Luca's, on the contrary, there are many passages which no Greek need have disavowed.

Of course we must remember that we are judging Luca by his best work and Donatello by a work which is far from his best, which could not have been his best, since its theme was not in accord with the most strongly marked side of his talent. And yet something of what we must say in comparing these individual works, we may say in comparing the two sculptors in all their works. It is true that Luca falls behind Donatello in many ways; but it is also true that he is more sure to delight us with pure plastic beauty, and much more certain to move us with a clear spiritual meaning.

Luca's bronze door to the sacristy of the Florentine Cathedral is undoubtedly one of his finest works; yet it is, I think, one of the

[1] Continued from page 148, No. 483.

least well-known, possibly because it has been somewhat overshadowed by the greater size and prominence of those baptistery doors near by which were wrought by Giovanni Pisano and Ghiberti. When I say that each of its ten panels shows a single seated figure with an angel on either hand, I say, of course, that the whole reveals far less of inventiveness, of bold imagination, than Ghiberti's and Pisano's portals; but the quiet harmony, the essential unity thus





Medallions by Andrea Della Robbia from the Hospital of the Innocents, Florence.
(From *L'Art.*)

secured are not qualities to be underrated, and when we examine the different panels and see the real diversity which underlies their similarity, we perceive that, though very reticent, artistic imagination is by no means lacking. Nothing could surpass the delicate, all but excessive care with which the reliefs themselves and the heads in the medallions of the border are carried out; Luca's training with a goldsmith here shows very plainly. Yet few even among Renaissance reliefs can equal his in their harmony of line, in their truly sculpturesque conception, in their dignity and serenity, and still fewer in their depth of Christian sentiment. No one who studies this door will again call Luca a merely graceful, amiable, charming artist — will deny him his own place, a high place though not one of the very highest among those contemporaries whom we recognize as lofty, noble, great.

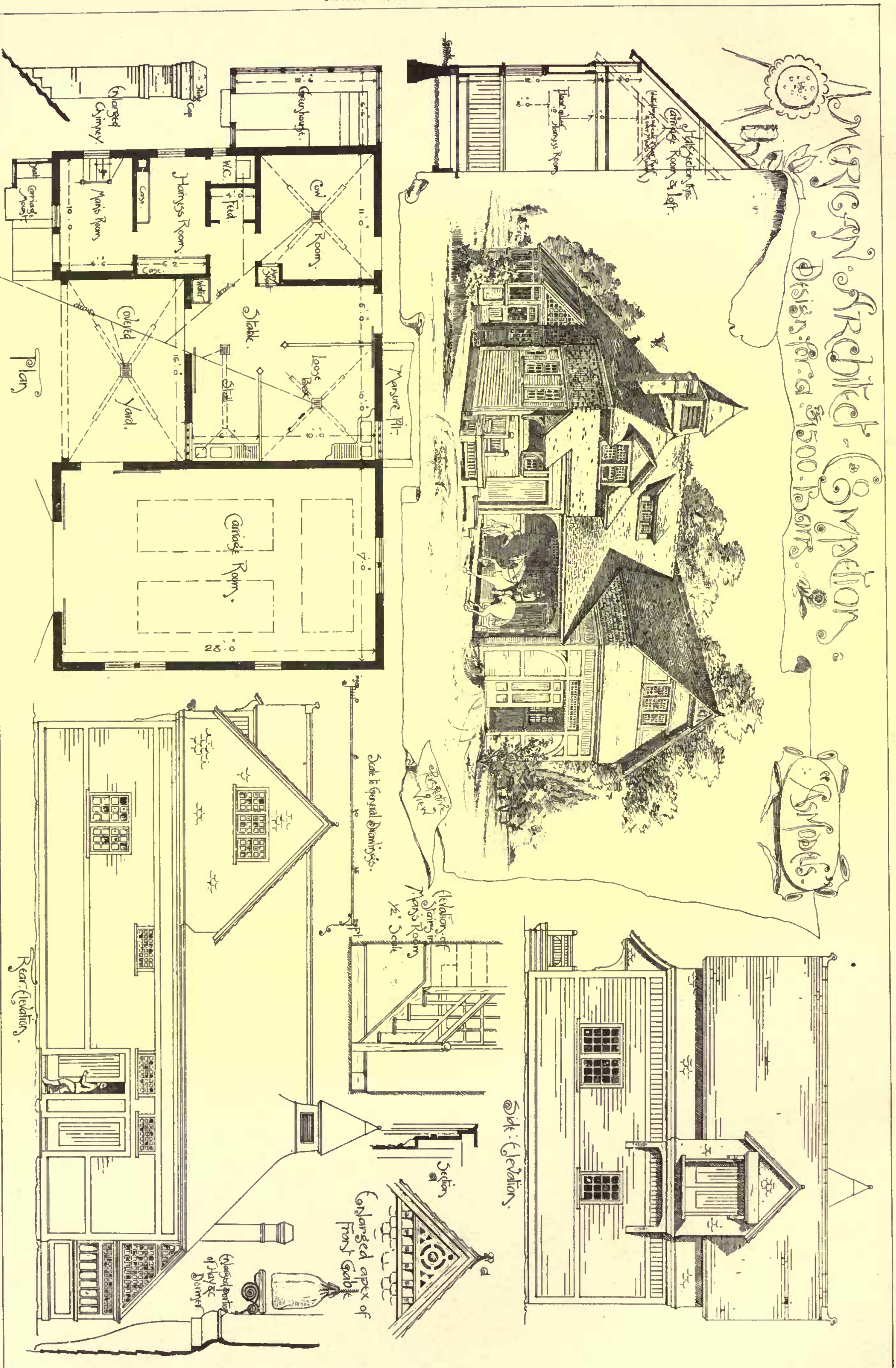
When he turns from bronze and marble to enamelled clay, Luca's sentiment and his strong plastic instinct remain the same, but we must no longer look for so acute a realism or so refined a technical language. Everything had to be broadened and simplified, in view of the necessities of the new material, of that covering enamel which, thin and pure and supple though it was, could permit no such sharp precision of line, no such subtile delicacy of modelling as could bronze or marble. And therefore I say that from one point of view it seems a pity that he should ever have discovered his new process. Beautiful as is such a work, for example, as the tympanum of the church-door at Urbino, with its half-lengths of the Madonna and four adoring monks, and its full-length of the Child, who stands before his mother on the edge of the relief, it would have been still more beautiful had marble been the medium. And the color, which adds such a value from the decorative or architectural standpoint, adds nothing, it seems to me, from the purely plastic.

I think I was justified in saying above that Luca always and everywhere renders a distinctly Christian sentiment in a distinctly legible way; for the instances are so few as to be very unimportant where he falls into a merely gracious realism. A realism which is hardly even gracious marks, indeed, his five bas-reliefs on the Florentine Campanile; but these Luca worked either from the actual designs of his forerunners in the task, or under a constraint to make his results match in theme and character with theirs. And there is, perhaps, one of his Madonnas — that in the tympanum of the Via del Agnolo in Florence — which, by contrast with his typical examples, we may call nothing more than a beautiful human mother. But I know of no other exceptions; for the only portrait-statue which he has left us (on the tomb of the Bishop of Fiesole), while it is admirably clear and personal in its portraiture — no likeness of the time could well be otherwise — is yet imbued with the artist's own characteristic sentiment. Compare it with other contemporary sepulchral figures, and we shall not call it, as we do call many of them, a piece of mere faithful portraiture, or of portraiture merely made beautiful as art. It is portraiture made beautiful by feeling, too; it is a piece of true Christian idealism.

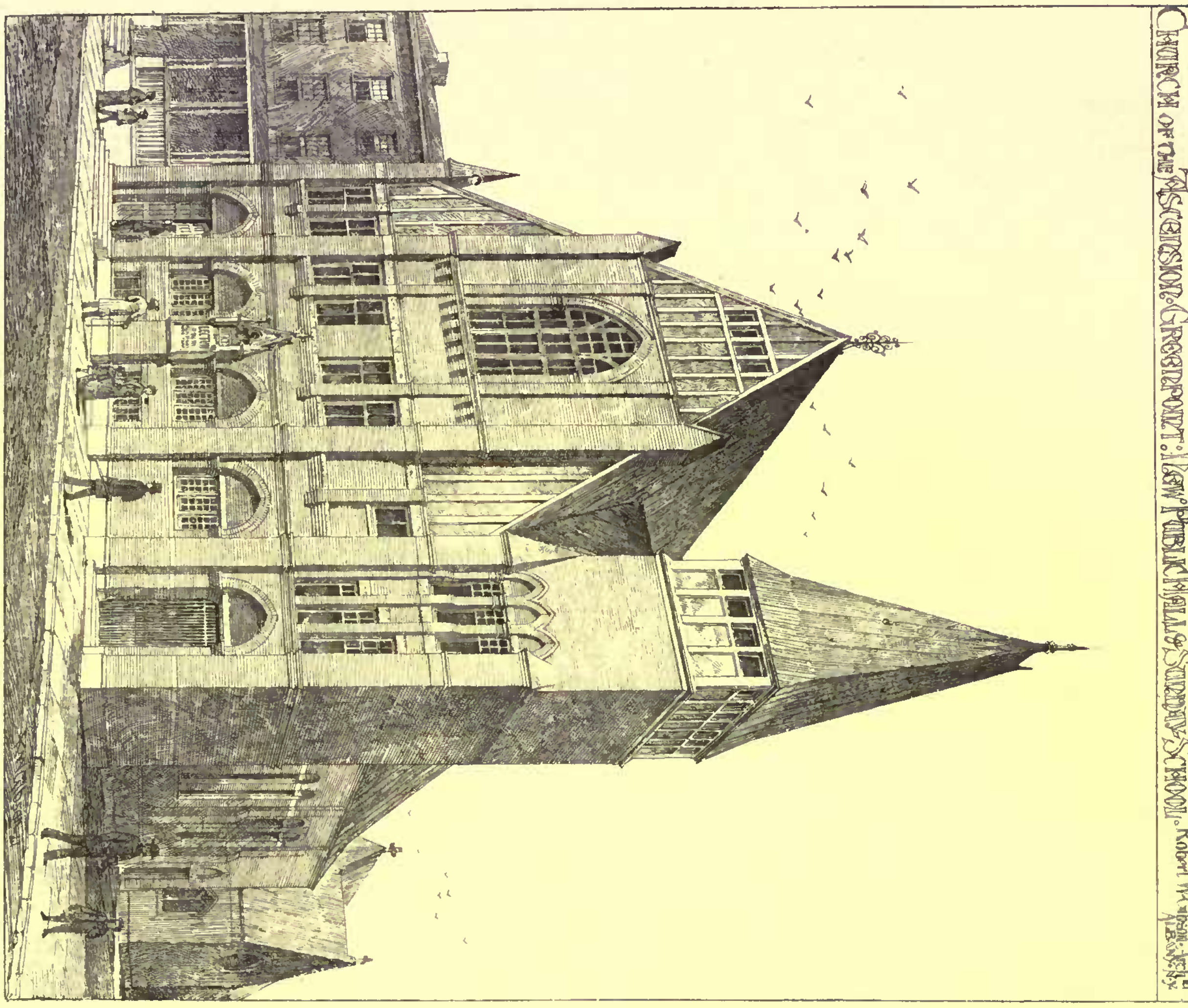
At the time of Luca's death, his nephew Andrea had already long been famous; but his activity was to last much longer still, and was to result in an infinitude of works, among which it is not always possible to distinguish those which were his own from those which were due to sons and scholars laboring with him in one of the great busy ateliers so characteristic of the age. His legacy in other materials than enamelled clay is so small that it need not detain us here: much more rightly than his uncle he may be identified with the new process. Technically he seems to have made no effort to develop its possibilities; he was satisfied with blue and white for his main effects, employing only in minor details and in his borders that fuller polychromy of which later so wide a use was made. But he adapted the art to an ever-lengthening list of objects, and made it indeed a helpful handmaid to the architect. Luca modelled reliefs for tombs and tabernacles; tympana, rosettes, medallions and tiles for wall and ceiling; and at least once a pair of figures in the round. But from Andrea's atelier came not only all of these in abundance, but whole tabernacles, great pictorial retables, vases, candelabra, friezes, fonts, pulpits and fountains. His work is also more ambitious in its use of many figures, and of much diversity in action and arrangement; but he is an inferior artist to Luca, and not only because he worked from Luca's inspiration, rather than from his own.

To begin with he is much less strong. The original ideal still persists, the original sentiment is still preserved, but with on the one hand a less elevated accent, and on the other a less forceful realism. Sometimes indeed we have no fault to find. Sometimes, when the theme is simply tender, it is hard to see much difference between Luca's art and his; but very often — and more and more as the years passed on — Luca's delicate feeling got a touch of sentimentality; his grace of line lost a little of its nobility; his simplicity be-became almost self-conscious. The early sweetness remained; much of the early strength and frankness had evaporated. And so we care most for those among Andrea's works where strength was least required. He has left us nothing better, I should say, than his many simple figures of the Madonna with her child, or than the famous medallions on the outside of the Hospital of the Innocents in Florence; those dozen of delicious babes in swaddling clothes, each of whom is so perfect in beauty and truth, yet each of whom has so distinct a little individuality of his own, quite different from that of his tiny brothers. But after all, such art as this, naïve and delightful though it be, is not art of the height and meaning Luca produced when he carved the children of his organ gallery.

Andrea's art again, became more decorative, less purely sculptural through the greater prominence he gave to the bordering of his reliefs. Luca's are commonly set in a very simple frame composed of delicately-designed mouldings, the classic style of which strikingly proclaims the extinction of Gothic art. He occasionally added also a second border; for example, of foliage; but Andrea increased the frequency and the importance of this, modelling it in very high relief and in very realistic forms of growing plants or garlanded fruits and flowers. When, as often, such a border is made so conspicuous as to overshadow somewhat the relief itself; or when it is used without any architectural motives at all and by itself builds the frame,



HELIOTYPE PRINTING CO BOSTON


Church of the Ascension, Greenpoint. New Public Hall & Sunday School. Robert W. Gibson Archt. Albany N.Y.

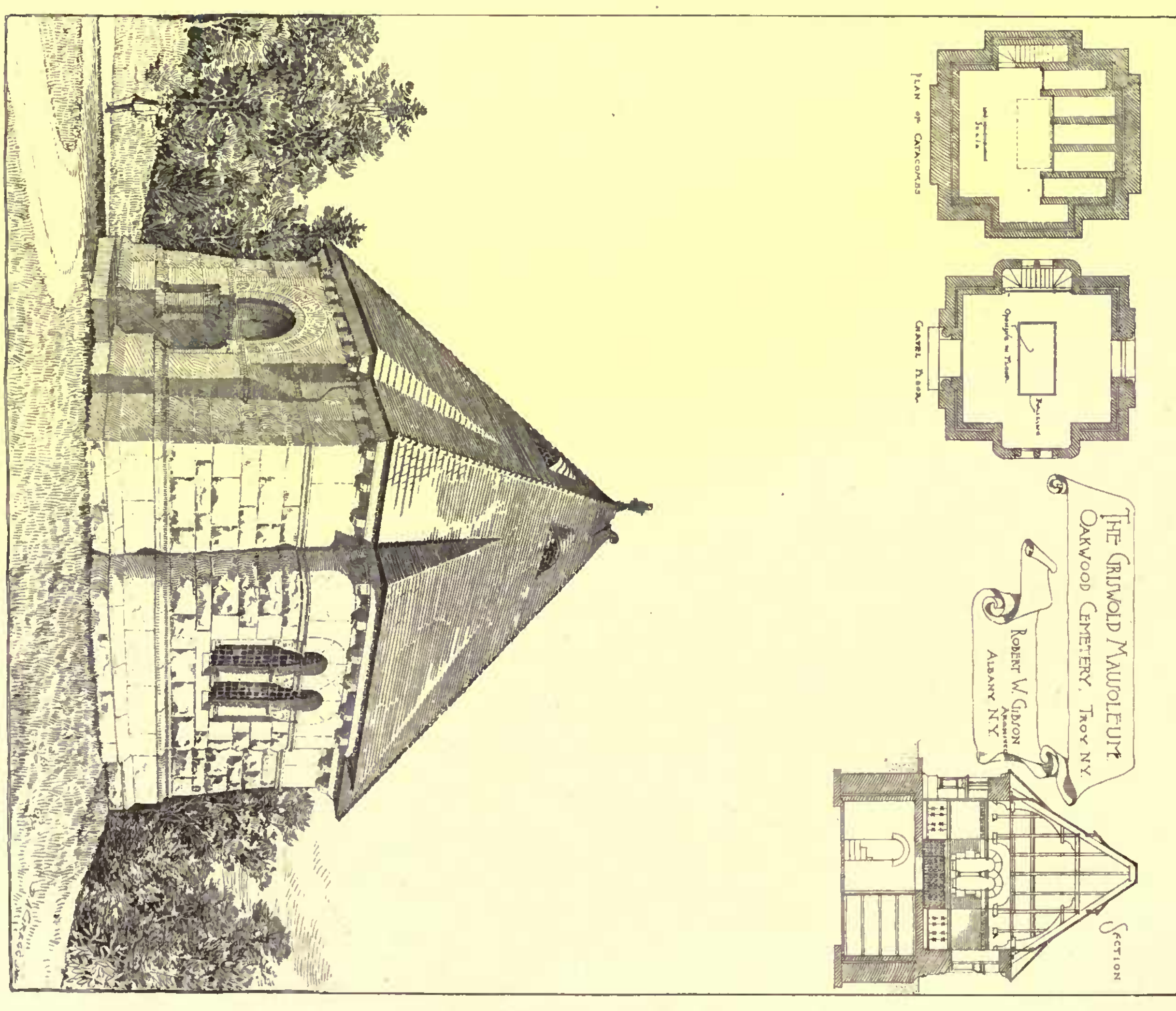
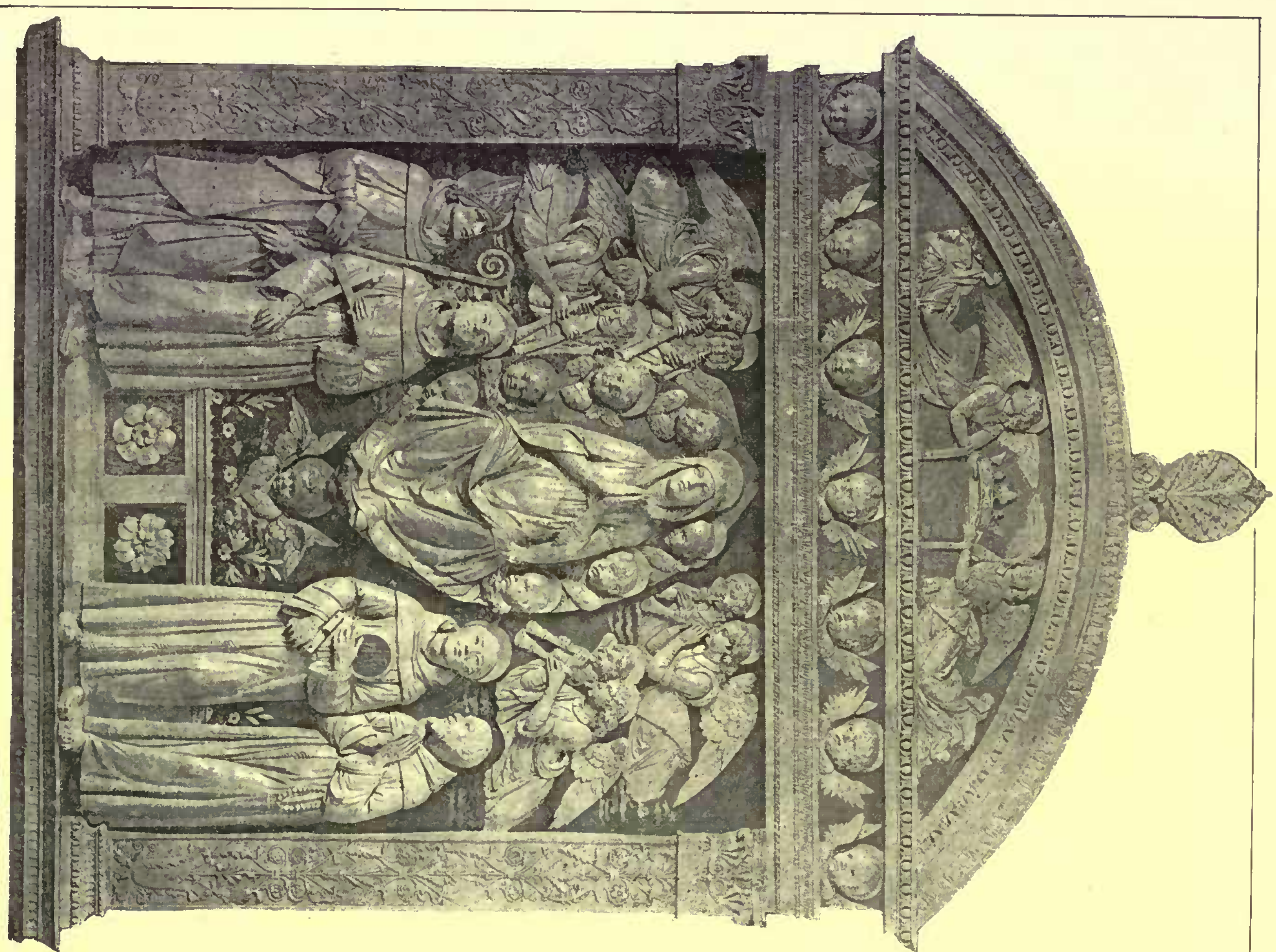

The Griswold Mausoleum. Oakwood Cemetery, Troy N.Y.
Robert W. Gibson Architect Albany N.Y.
Plan of Catacombs
Chapel Floor
Section
Heliotype Printing Co. Boston



PHOTO CAUSTIC, HELIOTYPE PRINTING CO. BOSTON.

The Grotto of Pozzuoli, near Naples.

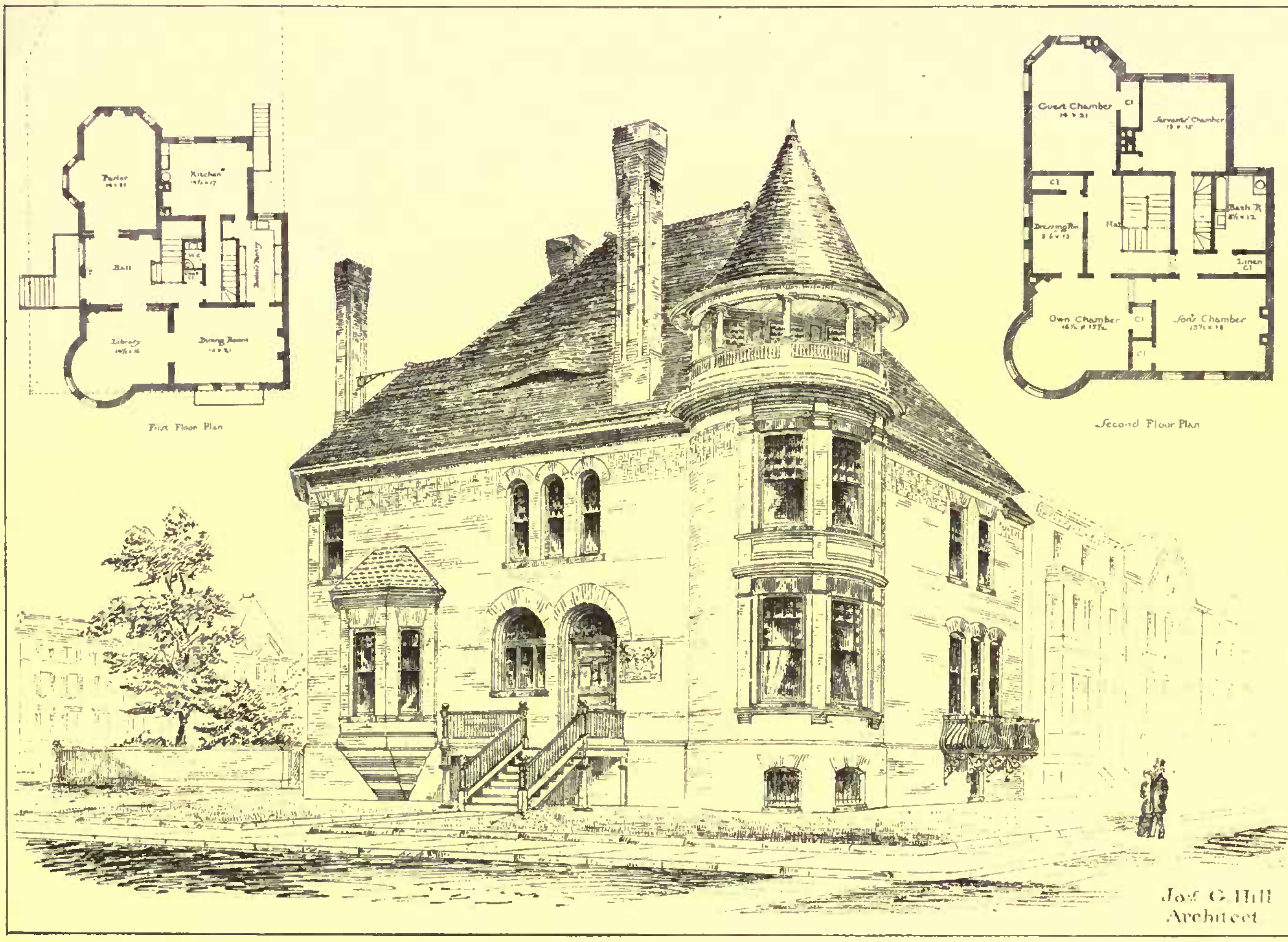


THE DELLA ROBBIA RETABLE.
METROPOLITAN MUSEUM OF ART, NEW YORK.

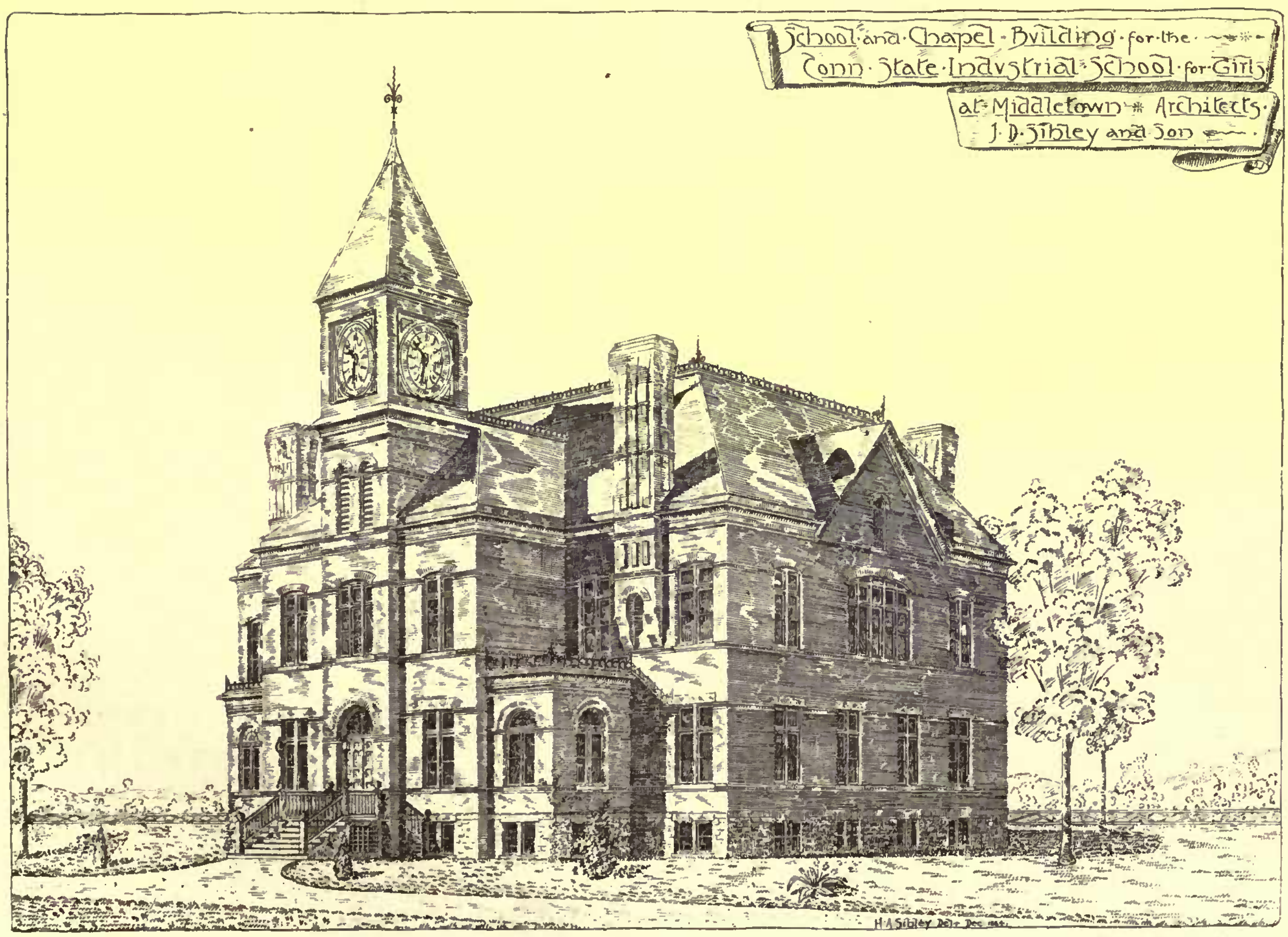


. FIRENZE Lunetta di Luca Della Robbia sulla Porta di S. Pierino (in Mercato).

PHOTO CAUSTIC, HELIOTYPE PRINTING CO. BOSTON



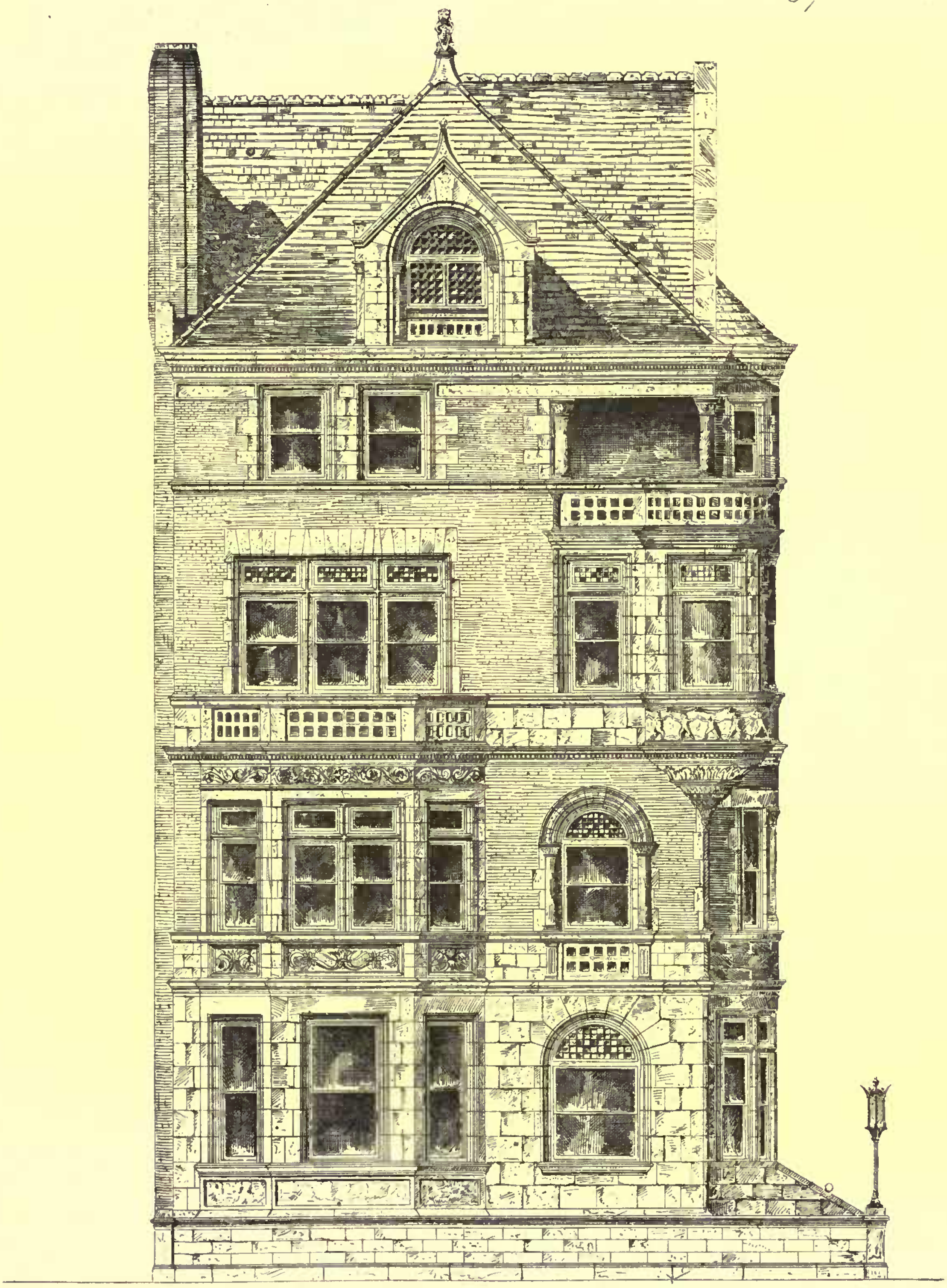
HOUSE FOR CHAPLAIN GEO. P. VAN WYCK U.S.A. WASHINGTON D.C.

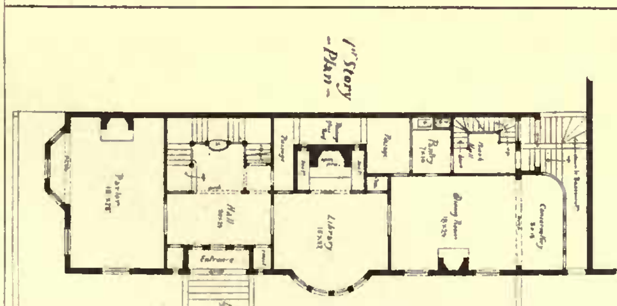


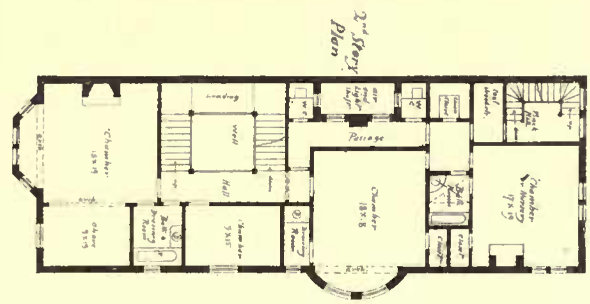
HELIOTYPE PRINTING CO. BOSTON

Design for a City House,
for a Corner Lot.

E. R. Tilton. Arch't.
149 Broadway N.Y.C.







then we recognize, I think, a slight decline in taste. In necessarily architectural examples, however — as in his great altar-pieces — Andrea's framework is often most charmingly proportioned and designed. But here, too, certain elements occur at times which, while they aid the richness, detract from the purity of the result. For example, he often adorns his architecture with rows of detached cherub-heads, intrinsically delightful, but architecturally rather out of place.

From all of this it may be understood why it was that I said the beautiful reredos at the Metropolitan Museum [1] in New York should be attributed to Andrea, not to Luca Della Robbia. Neither historical nor critical evidence can with the least confidence assign a similar work to the earlier master. But there are very many retables which are known to be Andrea's, and among them two or three with the strongest likeness to our own. Every characteristic speaks for Andrea — the nature of the work itself; the design of the architectural setting, in which the cherub-heads are introduced; the many figures and diversified action; and the slight lack of strength in expression and form we cannot but note when we draw a comparison with a typical Luca. But it is a very fine, pure and characteristic example of Andrea's art — that is to say, of the school when it was in its fullest development, and ere the period of its real decline had begun. There is no possible reason why we should attribute it to a later hand than Andrea; but, there is every reason — if criticism in art means anything at all — why we should *not* attribute it to Luca's. Judging from a photograph our authors call it a "precious" possession. Such it is in truth; one which would be a treasure to any European museum; but being such there is all the less necessity to claim for it any interest or value not properly its own.

M. G. VAN RENSSELAER.



Medallion by Andrea Della Robbia from the Hospital of the Innocents, Florence. (From *L'Art.*)

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

THE GRISWOLD MAUSOLEUM, TROY, N. Y. MR. R. W. GIBSON, ARCHITECT, ALBANY, N. Y.

THE Mausoleum is at Oakwood Cemetery, near Troy, N. Y., built for Mrs. John A. Griswold, of Troy, N. Y., by the New England Granite Company. It is of Westerly granite, of warm gray color, part rock-faced and part tooled; capitals are carved. The roof is of red tiles and terra-cotta. The entrance is a round arched opening in the massive wall, fitted with a handsome wrought-iron sliding grille and a panelled door of oak. Internally the walls are lined with a dado of polished granite, in slabs, of two colors, anchored to the walls with bronze bolts with decorated scroll heads. Above this the walls are of red pressed brick, with moldings of carved bands in terra-cotta and a frieze of dead bronze color. The roof is of oak in open timbering. The floor is of polished marbles in geometrical pattern. An oblong opening in the floor, fitted with a movable wrought-iron railing, shows the crypt and tablets below, and a stone stair in one of the recesses gives other access to it. The windows will be fitted with memorial stained-glass. The design is copyrighted.

[1] Quoting Dr. Oscar Berggruen of Vienna, Messrs. Molinier and Cavallucci describe the Metropolitan Museum reredos in the following terms: —

"Large retable. 'The Assumption.' In the centre the Virgin, seated on clouds, her hands joined, rises to heaven amid a glory of cherubim, while to the right and left float four groups of angels sounding on trumpets. Below is the sarcophagus of the Virgin ornamented with rosettes and filled with flowers. On the left, stand in ecstasy St. Augustine and St. Francis; on the right, St. Bernard of Sienna, and another monkish saint. Two pilasters, decorated with graceful candelabra, support a frieze ornamented with seven heads of cherubim. The tympanum, in the shape of a depressed arch, contains two floating angels bearing a crown. Figures enamelled in white on a blue ground, which is of a lighter tint in the *mandorla* around the Virgin. The style of this beautiful retable recalls the 'Coronation of the Virgin' in the Osservanza Convent at Sienna; the bas-reliefs at La Verna (especially the 'Madonna of the Girdle'); and the 'Coronation of the Virgin' in the Academy of the Fine Arts at Genoa. With every probability, therefore, one may attribute it to Andrea Della Robbia.

"It comes from Piombino where it adorned the main altar of the church. It was taken to Florence in 1830, and purchased a few years ago by an American, who generously presented it to the New York Museum. M. di Cesnola, director of this Museum, has placed it in a separate apartment where are shown a large number of photographs from the works of the Della Robbia family."

HOUSE, FOR REV. G. P. VAN WYCK, CHAPLAIN, U. S. A., WASHINGTON, D. C. MR. JAMES G. HILL, ARCHITECT, WASHINGTON, D. C.

THE exterior of this house, which will cost about $15,000, is of ordinary brick, selected reds.

DESIGN FOR A CITY HOUSE. MR. E. R. TILTON, ARCHITECT, NEW YORK, N. Y.

SCHOOL AND CHAPEL BUILDING FOR THE CONNECTICUT INDUSTRIAL SCHOOL, MIDDLETOWN, CONN. MESSRS. J. D. SIBLEY & SON, ARCHITECTS, MIDDLETOWN, CONN.

CHURCH OF THE ASCENSION, PUBLIC HALL, AND SUNDAY SCHOOL, GREENPORT, N. Y. MR. R. W. GIBSON, ARCHITECT, ALBANY, N. Y.

ENAMELLED TERRA-COTTA, BY LUCA DELLA ROBBIA, AND THE RETABLE, AT THE METROPOLITAN MUSEUM OF FINE ARTS, NEW YORK, N. Y.

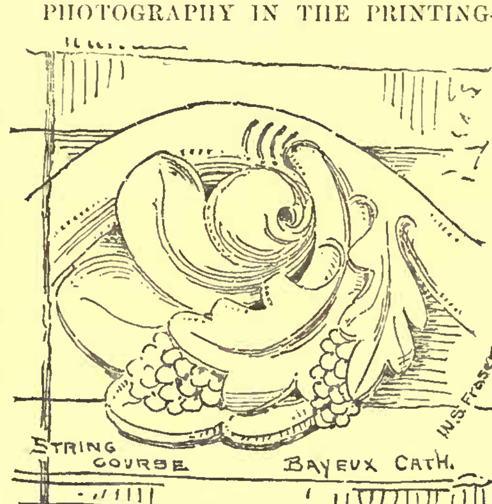
For description see article elsewhere in this issue.

COMPETITIVE DESIGN FOR BARN, SUBMITTED BY "*Asmodeus.*"

THE GROTTO OF POZZUOLI, NEAR NAPLES, ITALY.

This subterranean passage-way which leads from Baiæ to Averno, and known variously as the Grotta della Sililla, Grotta del Cane, Grotta di Posilipo, etc., is supposed to date from the time of Nero, and by some is said to be due to the incantations of the poet Virgil. In the fifteenth century Alfonzo I, sunk the floor to its present level, and in the following century Don Pedro di Toledo paved it and built the two air-shafts which ventilate it. The grotto is 2250 feet long, twenty-two feet wide, and twenty-five feet high at the entrance, which height increases to sixty-nine feet at the centre.

PHOTOGRAPHY IN THE PRINTING-PRESS.[1] — II.



IT may be well to refer here to some methods which are coming into use for mechanically converting photograpic subjects with half-tone into lines or dots, in place of making them by hand.

These methods have always run in one direction; that is, in efforts to break up the half-tone, or shading of the photograph, either by chemical or mechanical means, into a series of lines or dots. Directly this can be satisfactorily done, all photographic subjects are available for the ordinary methods of printing, by means either of photo-lithography or photo-engraving.

Photo-gravure is a process by which a copper plate is prepared, by photographic means, for printing by the ordinary method, in a copper-plate press. In a copper-plate the lines are engraved or cut into the plate. These lines are filled with ink by a dabber, which dabs the ink into them, that which is left on the surface of the plate, and not in the engraved lines, being cleaned away with rags and the palm of the hand. Paper is laid on the plate, and the ink is transferred by heavy pressure from the plate to the paper. Where large masses of shadow occur, some device has to be used to hold the ink, which otherwise would be cleared out by the rag and hand in cleaning. The shadows have therefore to consist of a series of cells, formed by cross-lines which make a tooth or grain, so to speak, to hold the ink and prevent its being wiped out in cleaning up.

In the photographic method of making a copper-plate to print from, let us begin at the wrong end. Instead of engraving on a sheet of copper, let us manufacture a sheet of copper on a photograph. Copper can be deposited on gelatine in a battery, to any desired thickness. Let the gelatine be a bichromatized sheet, on which an

[1] A lecture recently delivered before the Boston Young Men's Christian Union, by Mr. Ernest Edwards. Continued from page 151, No. 483.

image has been made under a photographic negative and swollen by water. Let this be placed in a battery and copper deposited on it, and we have a copper plate on which a design has been engraved photographically, with this exception: such a plate would have no tooth or grain in the shadows, and therefore it would not hold the ink. This objection is obviated by first forming a tooth or grain in the bichromatized gelatine. Under certain conditions and under certain treatment, gelatine can be made to wrinkle up, and to do so more or less according as light has acted more or less. This wrinkling-up property is imparted to the bichromatized gelatine which carries the design; it is repeated in the copper deposited on the gelatine, and becomes the grain or tooth which gives the ink-holding capacity to the final plate. The photo-gravure process, then, consists of, first, the negative; next, the image on bichromatized gelatine, modified so as to wrinkle up; the final printing-plate being produced by a deposit of copper on the gelatine in battery.

The magnificent results produced by this process in the hands of Messrs. Goupil are well known. As works of art and as examples of process-work, they are entirely unapproached. But I am bound to add that, highly as I esteem them, I look upon their beautyand excellence as produced not more by the process than by the perfection and skill of the whole surrounding workmanship, and also by the merits of the works of art of which they are reproductions — a set of factors which are only possible in Paris and in the house of Goupil & Co.

We now come to those processes where, though the results are obtained by photography, in a printing-press, not only the printing-plate but also the method or printing is novel. Of all of them, the woodburytype method is the most novel and the most unlike any other printing method.

What is known as nature printing is perhaps most closely allied to it. In nature printing, on a plate made of type-metal or something equally soft, is laid, say a fern; this is pressed into the soft metal by heavy pressure. When the fern is removed, a depressed image, an image in intaglio, remains in the metal, which is then inked up and treated somewhat as in the copper-plate method. In the Woodbury process a gelatine relief, produced photographically, takes the place of the fern and is pressed into the metal. First, as usual, comes the photographic negative, then the image on bichromatized gelatine. But the gelatine is not simply swollen by water; all the parts that have not been acted on by light, being still soluble, are dissolved and washed away with hot water. The resulting gelatine relief is dried and is pressed, like the fern, into soft metal; then comes the printing, which is very curious. This soft metal plate is really a mould, and is actually used as a jelly-mould. It is placed on a printing-press, and a little warm liquid jelly is poured on to it. Before the jelly has time to set, a piece of paper is laid on the jelly, and pressure is brought to bear, which squeezes out all the jelly that is not in the mould. The paper is withdrawn, bringing the jelly with it out of the mould, and it is dried. There are varying depths to the mould, so there will be varying depths to the jelly, and if, whilst the jelly was warm, before it was used, color had been added to it, varying depths of color would also appear in the jelly, and would make a picture, and all this would have been done by photography. The beautiful woodburytypes are all produced in this ingenious way.

Printing from the surface of the actual sheet of bichromatized gelatine is perhaps the best known form of photo-mechanical printing, and is practised under various names, such as albertype, heliotype, artotype, and so forth.

The principle underlying all this set of processes is that a surface of bichromatized gelatine, on which an image has been produced by light acting through a photographic negative, is somewhat analogous to that of a lithographic stone. In the latter, a design is drawn on the stone so as to make certain parts of it repellant of water, and to these parts greasy ink readily attaches itself. In the gelatine, light has produced a design repellant of water, by water-proofing the gelatine where it has acted. But the gelatine goes farther than the lithographic stone, which only recognizes black and white, for the gelatine recognizes shading or half-tone; that is to say, where there is shading or half-tone in the negative, the light makes the gelatine partly insoluble, so that it partly absorbs water, and greasy ink partly adheres and produces shading. This gives these methods a great advantage over the photo-lithography and photo-engraving methods, for all subjects that can be photographed are within their range, and the printing-plates are easily and cheaply prepared. As always, the negative is the first step; and, remember, any subject may be reproduced, and we are not confined to black and white originals. Then comes the printing on the surface of the bichromatized gelatine; then the preparing of this gelatine for the press — the various methods have varying devices to this end; then the plate is sponged with water, so that those parts which are not to take the greasy ink may absorb the water and repel it, otherwise ink would attach itself all over the plate; then the inking, which is usually done with two rollers and two inks, one finer than the other; finally the paper is placed on the plate and the impression is pulled, the operation being repeated as often as may be desired. It would be supposed that a delicate surface of gelatine, kept continually in a moist state, would hardly be capable of standing the rough usage to which it must be subjected in the process of printing; but in practice it is found to be very durable, and I think the very delicacy of the gelatine is its best protection. A large number of impressions may be pulled from one gelatine sheet, and the preparation of another, if required, is very simple.

The results of this method are so well known as not to need description. It is applicable to a large number of publication and reproduction purposes; it is largely employed for works of art, and wherever a cheap, quick and permanent substitute for photography is desired it has no rival.

In all processes of printing it is hardly necessary to say that ink of any color may be used, so that our prints may be of black, or red, or green, or of any color we choose; but from one plate they can of course only be of one color.

Various attempts have been made to apply color-printing to photo-mechanical and especially to gelatine printing. The latest results are those shown by the Fac-simile Company, of New York, in which all the gradations of tints of an original water-color sketch are reproduced, from photographic gelatine plates, in five or six printings.

I understand the basis of this method to be somewhat as follows:— The starting-point is that all colors are simply varying combinations of the three primary colors, red, yellow and blue. If we can photograph a colored picture, eliminating all the blues and yellows, the result will be a negative of the red parts of the picture only; similarly we may obtain a negative of the yellow parts only, and of the blue parts only. Now if gelatine plates are made of these three negatives and printed in their proper colored inks — blue, yellow, red — the result should be a picture similar in its arrangement of color, and having all the variations of color, of the original. Extra printings would no doubt be necessary to make up for the lack of purity in the pigments that are available for use in the arts. The theory of this method is captivating, and the results obtained so far give great promise.

In all of these processes which I have attempted to describe, photography is directly applied to the printing-press, and is not simply a means to the end, but is, in every case, a process complete in itself, unaided by the hand of the artist.

Photography is also used very extensively to assist in preparing work for the printing-press, as, for instance, in printing photographs on the wood block as a guide for the engraver; but with these applications we need not to-night trouble ourselves, nor have I attempted to describe any but the methods which are well established and which have taken their place in the world as commercial manufactures, and in re-enumerating the processes — photo-lithography, photo-engraving, photo-gravure, woodburytype, albertype, heliotype — and the manifold uses, the manifold good and educational uses, to which they are already put, I feel that photography, the youngest of the arts, whose good name was threatened by the sense of insecurity in her work, has cast off that reproach, and to-day is hand in hand with that art preservative of all arts — the art of printing.

TRANSPLANTING LARGE TREES.[1]


NICHE ON STREET ANGLE, BARCELONA, SPAIN.

TEN years ago more than one hundred trees of considerable size (from twenty to fifty inches in girth, or about one foot in diameter on an average) were transplanted on the Capitol grounds. They were not in a thrifty condition, and to adapt them to removal, their roots were cut off at a distance not greater in any case than three and a half feet from the trunk. Their branches were also closely shortened in, reducing their heads to from one to two-thirds their original size. It was considered a question whether the trees would retain enough of vital energy to survive, and the operation was often referred to for some years afterwards as an injudicious and disastrous one. It is therefore desirable that attention should be called to the results as now to be observed. The condition of two of the trees was regarded at the time as especially hazardous, and these were placed where in case of failure their absence would not be important. After three years they were still living, and promising to live, but not to flourish; they therefore were felled.

Of the remainder no tree has died as the result of the removal, and those that have escaped serious injury from causes not connected with the removal are all now living and in a thriving condition. In general, their heads are much larger as well as much denser than they had been before they were shortened in, and they are growing more rapidly than before their removal Their rate of

[1] By Frederick Law Olmstead, from the Report of the Architect of the Capitol at Washington.

growth is also more rapid than that of trees on the ground of corresponding species and age that have not been removed, the reason being that the soil about the latter could not be thoroughly improved without lifting them.

To more distinctly present the degree in which the operation has been successful, twenty of these transplanted trees have been measured, selecting those which, because of their size or other circumstance, presented the greater difficulties. The measurements are given below, and supply indices of the present thrift of the trees. Similar measurements are also given of trees of numerous sorts obtained from commercial nurseries, or from the indigenous woods near Washington, these when removed having been generally small saplings.

Trees of the list A were moved by machine in the fall and spring of 1875–76 and (except a few of the smaller, taken from the Botanic Garden) from a thin soil on a stiff clay subsoil to a prepared soil and subsoil (described on page 15 of the Report of the Architect of the Capitol for 1882). Those from the Botanic Garden were from better soil and more sheltered positions.

The machine used is described and pictured in the report on forestry, prepared under the direction of the Commissioner of Agriculture, pursuant to an Act of Congress, approved August 15, 1876, pages 84, 85. The roots of all were cut to "balls" (not frozen), generally of a diameter of eight feet, none larger. Their heads were shortened in fully one-third, in some cases two-thirds. Since transplanting they have been several times lightly top-dressed, and in periods of severe drought have been watered. They have had fully

A.

PRESENT MEASUREMENTS OF LARGE TREES TRANSPLANTED AT WASHINGTON IN 1875-76.

No.	Common Name.	Girth.	Height.	Sweep.	Shoots.	Observations.
		′ ″	′ ″	′ ″	′ ″	
1	White Elm	5 10	51 6	47 0	3 1	Ulmus americana. Upright, 5′; lateral. 8′.
2	" "	5 11	66 6	42 0	1 3	Ulmus americana. Upright, 8′; lateral, 12′.
3	" "	6 5	61 0	35 0	1 11	Ulmus americana. Upright, 10′; lateral, 14′.
4	English Elm	6 9	60 0	42 0	2 5	Ulmus campestris. Upright, 8′; lateral, 12′.
5	Wahoo "	4 2	42 0	48 0	2 9	Ulmus alata. B. G. Upright, 15′; lateral, 13′.
6	White Oak	4 7	51 0	27 0	1 3	Quercus alba. Upright, 9′; lateral, 10′.
7	Willow "	3 4	40 0	26 0	1 8	Quercus Phellos. Trimmed to a pole. Upright, 18′; lateral, 16′.
8	Pin "	3 7	35 0	39 0	1 3	Quercus palustris. B. G. Upright, 10′; lateral, 10′,
9	Royal "	3 9	28 0	36 0	2 6	Quercus Robur. B. G. Lateral, 14′.
10	Sugar Maple	2 7	38 0	32 0	0 10	Acer saccharinum. Upright, 6′; lateral, 7′ 6″.
11	" "	3 2	35 0	27 0	1 0	Acer saccharinum. Upright, 13′; lateral, 8′.
12	Norway "	3 1	31 0	33 0	0 11	Acer platanoides. Upright, 12′; lateral, 10′.
13	Scarlet "	3 1	34 0	36 0	1 4	Acer rubrum.
14	Silver "	4 3	48 0	39 0	2 6	Acer dasycarpum. Upright, 18′; lateral, 19′.
15	Box Elder	3 11	35 0	42 0	2 5	Negundo aceroides. B. G. Upright, 19′; lateral, 13′.
16	American Beech	2 3	30 0	24 0	1 8	Fagus ferruginea. Upright, 16′; lateral, 6′.
17	Plane	3 10	40 0	38 0	3 2	Platanus orientalis. B. G. Upright, 18′; lateral, 14′.
18	Linden	4 4	42 0	42 0	1 1	Tilia europæa. Upright, 5′; lateral, 7′.
19	White Ash	4 9	48 0	32 0	1 9	Fraxinus americana.
20	Madeira Nut	4 1	32 0	33 0	1 7	Juglans regia. B. G. Upright, 6′; lateral, 6′.
21	American Holly	2 4	17 6	18 0	0 8	Ilex Opaca. Heavily fruiting.
22	Horse Chestnut	5 2	36 0	36 0	0 7	Æsculus Hippocastanum. This was one of two Horse Chestnuts near together. That originally the larger was not moved, and is now the smaller in girth, height and breadth.

the usual struggle with vermin, and most of the elms have this year been denuded of foliage.

Trees of the list B, except as stated, were planted in 1876–77. They had been obtained from commercial nurseries, largely from Washington and Baltimore, and when planted were saplings from half an inch to an inch and a half in thickness of stem and three feet to six feet in height. Those noted as "wild" were obtained from woods near Washington, and several of these being injured or stunted were, the second year, cut to the stumps, and the present growth is from the ground since planting.

In the column "girth" the circumference of the tree is given at two feet from the ground; in that of "height," distance from the ground of the uppermost twigs of the tree; in that of "sweep," distance between opposite outer twigs; in that of "shoots," measurement of shoots of this year's growth at ends of lateral branches (usually the trees are well balanced and, except elms, symmetrical. The entire upright growth and lateral growth on one side in ten years after planting from limbs then stumped is given where observed. In the last column "B. G." means from the Botanic Garden. The measurements given were made 14th, 15th, and 16th of September, 1884. Measurements are in feet, or in feet and inches.

In a comment upon the above a writer in the *Gardeners' Monthly* says, "It is an extremely interesting commentary on the prevalent opinion, industriously fostered in some quarters, that there is any serious difficulty in getting large trees to grow. In this part of the world an experience of thirty years has shown that it is not necessary for even the expense of the ball of earth cared for in the Washington experiments. The transplanter commences four feet or five feet from the trunk, gets all the roots he can, and carries as little

B.

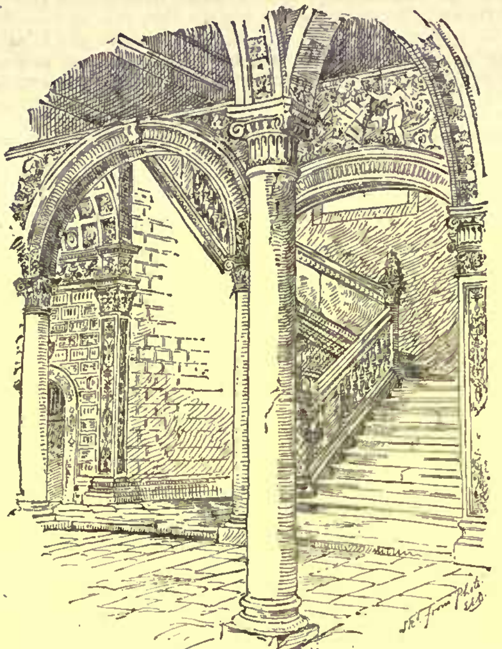
PRESENT MEASUREMENTS OF SMALL TREES TRANSPLANTED IN 1876–77, OBTAINED FROM NURSERIES.

No.	Common Name.	Girth.	Height.	Sweep.	Shoots.	Observations.
		′ ″	′ ″	′ ″	′ ″	
1	American Elm	3 4	36 0	24 0		Ulmus americanus.
2	" "	2 10	24 0	30 0	2 10	Ulmus campestris.
3	Cork "	2 9	29 6	26 0	1 7	Ulmus suberosa.
4	Planera	2 1	22 0	24 0		Planera aquatica. Upright growth, 15′.
5	Over-cup Oak	1 8	25 0	15 0	0 8	Quercus macrocarpa.
6	Chestnut "	1 4	26 0	21 0	1 8	Quercus Prinos.
7	Spanish "	2 0	27 0	15 0	1 1	Quercus falcata.
8	Willow "	3 1	36 0	36 0	1 6	Quercus Phellos.
9	" "	2 5	27 0	25 0	1 6	Quercus Phellos.
10	Royal "	3 4	28 0	36 0	2 0	Quercus Robur.
11	" "	2 5	28 0	27 0	1 3	Quercus Robur.
12	Scarlet Maple	2 1	27 0	24 0	1 10	Acer rubrum.
13	Field "	2 7	19 0	18 0		Acer campestre.
14	" "	3 10	24 0	24 0	1 4	Acer campestre.
15	White Ash	2 8	24 0	18 0	1 3	Fraxinus americana.
16	" "	1 11	23 0	21 0	1 0	Fraxinus americana.
17	Coffee Tree	1 5	25 0	24 0	1 8	Gymnocladus canadensis.
18	Oriental Plane	3 5	43 0	41 0	2 3	Platanus orientalis. Penn'a circle; imported, 1877.
19	" "	3 3	42 0	40 0	2 3	Platanus orientalis. Upright, 30′.
20	Tulip	2 1	26 0	21 0	1 7	Liriodendron Tulipifera.
21	Yellow-wood	1 0	20 0	24 0	2 0	Cladrastis tinctoria.
22	American Chestnut	1 8	21 0	17 5	1 10	Castanea vesca. Upright, 16′; wild.
23	Shingle Oak	2 5	17 6	13 0	8 6	Quercus imbricaria. Damaged plant; recovering.
24	Norway Maple	3 7	42 0	35 0	1 0	Acer platanoides. Upright, 8′; lateral, 4′; 1876.
25	Sycamore "	2 11	38 0	27 0	0 6	Acer pseudo-platanus. Upright, 6′; lateral, 4′; 1876.
26	Sugar "	3 7	36 0	41 0	0 10	Acer saccharinum. Upright, 6′; lateral, 6′ 6″.
27	Buckeye "	4 10	44 6	33 0	1 11	Æsculus glabra. Upright, 4′; lateral, 6′; 1876.
28	Turkey Oak	1 9	18 0	14 0	1 4	Quercus Cerris.
29	American Hornbeam	1 6	20 0	14 0	2 9	Carpinus Betulus.
30	Persimmon	1 2	17 0		2 0	Diospyros virginiana. Stump; wild growth from ground.
31	Oleaster	2 9	22 0	24 0	0 4	Elæagnus hortensis.
32	Angelica	0 8½	10 0	6 0		Aralia spinosa.
33	Christ's Thorn	1 3	13 0	15 0	2 3	Zizyphus vulgaris. Loaded with fruit.
34	Cucumber	1 2	15 0	10 0	1 5	Magnolia acuminata. Planting height, 4′.
35	Yellow Cucumber	1 7	16 0	15 0	1 5	Magnolia cordata. Planting height, 3′.
36	Great-leaved "	0 10	13 0	7 0	1 5	Magnolia macrophylla.
37	Sassafras	1 6	17 0	15 0	1 8	Sassafras officinalis. Wild.
38	Osage Orange	1 5	20 0	30 0		Maclura aurantiaca.
39	Catalpa	2 0	19 0	24 0	0 10	Catalpa bignonioides.
40	Golden Catalpa	2 8	23 0	24 0	2 0	Catalpa bignonioides; var. aurea.
41	Japan "	2 4	29 0	22 0	3 0	Catalpa Kæmpferi.
42	Cedrela	1 7	27 6	6 0	4 0	Cedrela sinensis. Lower laterals removed.
43	Dogwood	1 6	12 0	15 0	8 0	Cornus florida. Stump; wild.
44	Redbud	2 2	14 0	24 0	1 8	Cercis canadensis. 1876.
45	Sweet Gum	1 9	23 0	17 0	1 3	Liquidambar styraciflua. Wild; upright, 19′; 1876.
46	Lime	2 2	22 0	21 0	1 1	Tilia europæa.
47	Scotch Birch	1 7	28 0	18 0	15 0	Betula alba. Upright, 24′; 1878.

earth as possible. A cart is placed up against the tree, the shafts lashed to the trunk, a rope attached to the top of the tree, and the axle serving as a prop for the lever, a ton or two of tree is easily lifted. A horse is attached to the tail end of the cart, and, root foremost, the tree is hauled and dropped into the hole prepared for it. A tree, by this plan, twenty-five feet or thirty feet high, and with a trunk three feet or four feet in circumference, can be dug, taken a mile and replanted for about £5, and more safely, we think here, than by the ball method."

PNEUMATIC DESPATCH BETWEEN LONDON AND PARIS. — A plan for the transmission of mails between Paris and London, by the pneumatic process devised by a M. Berlin, is exciting considerable interest. The following are a few particulars of the scheme: The pneumatic tubes or subway would be laid down alongside the existing railways for convenience sake. The total distance between the two capitals is four hundred and seventy-five kilometres, viz.: Paris to Calais (rail), two hundred and ninety-seven kilometres; Calais to Dover (Channel) thirty-nine kilometres; and Dover to London (rail), one hundred and thirty-nine kilometres. The pneumatic subway would be constructed of cast-iron pipes of thirty-nine centimetres in diameter and four metres in length, connected by means of India-rubber points. This arrangement has the effect of giving great flexibility and elasticity to the whole, and of making it water-tight besides. The carriage suggested is composed of a wire frame covered by a sheet of asbestos-cloth with a metallic warp. This covering would have a kind of metallic brush coating, to enable the compressed air to dilate to a certain extent around the truck and cool the latter, thus counteracting the heat produced by the friction. A truck would travel the distance between the two capitals in one hour, and one could be despatched every ten minutes. An engine of from twenty-eight to thirty horse-power would be sufficient. — *New York Evening P*

DR. W. B. RICHARDSON.



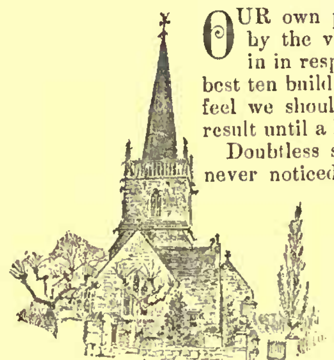
Renaissance Staircase: Santa-Cruz, Toledo: Spain.

IN Manchester Square, says the *Citizen*, one of the leading houses is inhabited by a gentleman of the name of Richardson, who, if ever we have a rational system of government, will be placed at the head of the Board of Health. We will take the reader to the doctor's home in Manchester Square. The chances are, if we call upon him, we shall find him either very busy in his consulting-room or preparing an article on his favorite study for the press, or in making notes of an address or lecture to be given, perhaps, that night. He was the intimate friend and physician of George Cruikshank in his latter days, and the works of our modern Hogarth decorate the drawing-room. The doctor has a son an artist, and is himself an artist in words. His books are pictures of a world from which disease is driven away, where feeble health is unknown. His speeches are poems, with Hygeia for his theme. Yet he can be practical; and the clearest address we ever heard on that much-ventilated but little understood subject of drainage was one we heard him deliver. The doctor is great at organization, and is a perfect master of the way to conduct public business, as has been repeatedly shown at the various societies with which he is more or less connected. On public platforms the doctor is a conspicuous figure. Somewhat inclined to be stout, with a face rather jovial than scientific, with an ample voice and a ready command of language, he is a great contrast to many of his brethren. Indeed, you might take him for a country squire rather than for a fashionable physician at the West End. In private life, that is, in general society, he is equally the squire, full of fun and good nature, rather than the highly trained and somewhat affected man of science. It is often said appearances are deceptive. That is true as regards Dr. Richardson, of whom, however, it may be said that, while not living in his model city — indeed inhabiting a vast metropolis very much the reverse — he is a picture of good health, and the good spirits which generally attend upon good health.

The doctor is ever on the lookout for new ideas. He is a man of progress; his latest appearance in public is as president of the Tricycle Club. Long before his scientific researches into the nature and properties of alcohol, Dr. Richardson had become known as a successful scientific explorer. In 1865 he conducted an experimental inquiry on the poisons lurking in contagious diseases, which resulted in the discovery of a specific poisonous product, to which he gave the name of septine, and which he believes is common to these poisons. In 1866 he introduced the application of the ether spray for the local abolition of pain in surgical operations; and as far back as 1854 we find him bringing out the first number of the journal of *Public Health and Sanitary Review* (he had previously vainly endeavored to establish the first journal of public health in this country). He was backed in this enterprise by the Epidemiological Society, and every sanitary reformer came to his help. For the title-page of his review he invented the sentence which has now passed into one of our best-known national proverbs, and which might take its stand among the sayings of the Seven Wise Men of Greece: "National health is national wealth." The doctor deserves well of the public in this matter.

Dr. Richardson was born at Somerby, Leicestershire, in October, 1828. He took his first medical and surgical diploma in 1850; in 1854 he graduated in medicine at St. Andrew's, and in 1859 he received the honorary degree of M.A., from the same university. In 1861 he became a Fellow of the Royal College of Physicians. His numerous essays on medical subjects won him many friends. Learned societies on the Continent and in America have delighted to do him honor; but perhaps that by which he became best known was by the delivery, in 1874 and 1875, of his far-famed "Cantor Lectures," before the Society of Arts. It was these that won for him the enthusiasm of the temperance public, who pushed his works everywhere, and got him to lecture all over the land. One of his most useful and popular works, "*The Diseases of Life*," was published in 1876, and rapidly went through several editions. His offices are many. He is honorary physician of the Royal Literary Fund, the Newspaper Press Fund, and to the National Society of Schoolmasters. He was elected a member of the London School Board by a unanimous vote. In 1860, in consequence of his various contributions to science and medicine, six hundred of his medical brethren and scientific friends united in presenting him with a testimonial in the shape of a microscope by Ross, and one thousand guineas. In 1877 the honorary degree of LL.D. was conferred upon him by his own university, St. Andrew's. It was well deserved, for certainly that ancient university has rarely had a more distinguished son, certainly not one who has worked harder or with more success for the happiness and well-being of the community at large. In the prime of life, the doctor may yet live to see his Hygeia built, and the millenium on which he eloquently dilates initiated.

THE BEST TEN BUILDINGS IN THIS COUNTRY.



Box Church: Eng.

OUR own purposes have been fully subserved by the votes which have already been sent in in response to our invitation to name the best ten buildings in this country, but we do not feel we should be justified in announcing the result until a heavier vote has been polled.

Doubtless some think the idea foolish; some never noticed our invitation; others forgot it; others hesitate to vote, as they do not wish to commit themselves, even under the seal of confidence; and others again find it difficult to name more than the first two or three, and need suggestion as to how the list can be filled up.

Therefore as hint, reminder, stimulus and suggestion to these several classes, it may be useful for us to say that, as the following buildings have already been most frequently mentioned, they may fairly be considered as in nomination, and we trust we do not deceive ourselves in the expectation that this preliminary publication will call out yet more votes, and not necessarily for these buildings only.

As a stimulus to further interest in this matter, we will say that the building which has polled the most votes has received 86 per cent of the suffrages, while the building next on the list is supported by only 46 per cent of the voters.

It is hardly necessary to say that the present list is not arranged with any reference to the number of votes already cast.

NEW YORK, N. Y.

Trinity Church. Richard Upjohn, Architect.
Union Theological Seminary. Potter & Lord, Architects.
Jefferson Market Court-House. F. C. Withers, Architect.
Columbia College. C. C. Haight, Architect.
House of W. K. Vanderbilt. R. M. Hunt, Architect.
House of C. Vanderbilt. G. B. Post, Architect.
House of W. H. Vanderbilt. Atwood & Snooks, Architects.
Metropolitan Opera-House. J. C. Cady & Co., Architects.
Manhattan Storage Warehouse. J. E. Ware, Architect.
Produce Exchange. G. B. Post, Architect.
Jewish Synagogue. L. Eidlitz, Architect.
Casino Theatre. Kimball & Wisedell, Architects.
Grace Church. Renwick & Sands, Architects.
St. Patrick's Cathedral. Renwick & Sands, Architects.
Lenox Library. R. M. Hunt, Architect.
Union League Club-House. Peabody & Stearns, Architect.
Mutual Life Ins. Co.'s Building. C. W. Clinton, Architect.
Tiffany Flats. McKim, Mead & White, Architects.
Villard House. McKim, Mead & White, Architects.
Academy of Design. P. B. Wight, Architect.
City-Hall.
Manhattan & Merchants' Bank. Wheeler Smith, Architect.
Dakota Flats. H. J. Hardenbergh, Architect.
Mills Building. G. B. Post, Architect.

BOSTON, MASS.

Trinity Church. Gambrel & Richardson, Architects.
Ames Building. H. H. Richardson, Architect.
Boston & Providence R. R. Station. Peabody & Stearns, Architects.
Brattle-Street Church (Tower). Gambrel & Richardson, Architects.
Y. M. C. A. Building. Sturgis & Brigham, Architects.
Art Club Building. W. R. Emerson, Architect.
Museum of Fine Arts. Sturgis & Brigham, Architects.

CINCINNATI, O.

Music Hall. Hannaford & Procter, Architects.

WASHINGTON, D. C.

U. S. Capitol. Hallet, Hadfield, Hoban, Latrobe, Bulfinch, Walter, Clark, Architects.
State, War and Navy Building.
White House. James Hoban, Architect.

CHICAGO, ILL.

Cook County Court-House. J. J. Egan, Architect.
Philadelphia R. R. Depot. L. Eidlitz, Architect.
Pullman Building. S. S. Beman, Architect.

PHILADELPHIA, PA.

New City-Hall. J. McArthur, Jr., Architect.
Broad-Street R. R. Station. Wilson Bros. & Co., Architects.
Masonic Temple. J. H. Windrim, Architect.
Insurance Co. of North America's Building. Cabot & Chandler, Architects.
Girard College. T. U. Walter, Architect.

CAMBRIDGE, MASS.

Harvard Law School. H. H. Richardson, Architect.
Memorial Hall. Ware & Van Brunt, Architects.
Seaver Hall. H. H. Richardson, Architect.
Harvard Gymnasium. Peabody & Stearns, Architects.

ALBANY, N. Y.

City-Hall. H. H. Richardson, Architect.
Capitol (original design). Thos. Fuller, Architect.
Capitol (rehabilitated design). Eidlitz & Richardson, Architects.

MISCELLANEOUS.

St. Stephens, Lynn, Mass. Ware & Van Brunt, Architects.
Boston & Albany R. R. Depot, Worcester, Mass. Ware & Van Brunt, Architects.
Crane Library, Quincy, Mass. H. H. Richardson, Architect.
Town-Hall, North Easton, Mass. H. H. Richardson, Architect.
State Capitol, Hartford, Conn. R. M. Upjohn, Architect.

THE SUTRO LIBRARY.

SAN FRANCISCO, March 27, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — San Francisco has reason to be proud of her rapid growth, her *to be* beautiful park, glorious climate, and other numerous attractions, and in a few years the Sutro Library will be perhaps the most worthy object of admiration we have.

Mr. Adolph Sutro, whose indomitable courage and natural ability conceived and carried out the scheme of the Sutro Tunnel on the Comstock, after years of opposition and trials, and who happily made a fortune thereby, has conceived another project, already in operation, namely, collecting a technical library, which he will endow and give to the City of San Francisco.

A librarian is now cataloguing about seventy thousand rare volumes, which, outside of their value as scientific and art works, are a great curiosity. Many of them are manuscript works, lettered before printing was discovered, whose illuminated title-pages and headings are a perfect feast for artist, designer and architect. A noteworthy fact about these volumes, four and five hundred years old, is that the bindings are so perfect and thorough that one can turn the covers back till they meet, a virtue modern book-binders could emulate to their credit. The guards and clasps are many of them very beautiful in design, but unfortunately most of the old volumes have been stripped of these by pillagers, as these guards and clasps were often of silver and bronze.

The books have not been assorted as yet, so the writer cannot give you any list of architectural works, but it is Mr. Sutro's idea to make a complete collection, not only in this line, but of all the arts and sciences, and to this end has now employed in Europe bookworms and agents who are continually sending rare volumes.

Among the many interesting papers are hundreds of old proclamations of the Houses of Parliament in England, before and after the time of Cromwell; a copy of the Vinegar Bible, also of the Breeches Bible, and other rare and curious editions of bibles.

Mr. Sutro's plan is to collect at least three hundred thousand volumes of purely technical works, so that students on this coast shall have advantages equalled by none in the United States and even in Europe.

It is pleasant to see the higher aims of a wealthy man thus being carried out whilst we are in the midst of such disgraceful scenes as those of the Sharon trial. W. F. S.

FIRE-PROOF BUILDING.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Having read with much interest the course of papers you published some time ago, by Mr. Clark, on church building superintendence, I would suggest that it might be of great interest and benefit to many of your readers if a similar series could be published on the construction of a fire-proof business and office building. Can you mention anything that has been published directly in this line? Yours truly, A SUBSCRIBER.

[A PAMPHLET published ten or twelve years ago by the American Institute of Architects, on Fire-proof Construction, by Mr. P. B. Wight, gave, better than anything we know, the elements of the science of fire-proof building as then understood. Since that time Mr. Wight, both in his own name, and for the fire-proof construction company with which his name is now connected, has published various excellent occasional articles and papers. Mr. Whiting's book on Fire Protection of Mills, although dealing with a single branch of the subject, discusses principles of the widest application to buildings of all sorts. Lastly, the articles on Recent Improvements in Building, published in Nos. 464 and 465 of this journal, give some information as to the most modern practice. We are much obliged for the suggestion that the connected history of the construction of a fire-proof building might be useful, and will certainly keep it in mind.—EDS. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS.

THE URSULINE CONVENT RUINS, SOMERVILLE, MASS. — The ruins of the Ursuline convent at Somerville, Mass., which have stood for more than half a century as a silent reminder of the violence of the anti-Catholic mob which destroyed the building on the night of August 11, 1834, are at last to be removed, the estate having passed into the hands of Mr. W. G. Howe.

ARSENIC WALL-PAPER. — The quantity of arsenic which was at one time employed in the manufacture of paper-hangings may be inferred from what was said by Mr. Aumorier, in the paper read by him at the Building Exhibition on Monday. One firm in the trade stated that they formerly used on an average one ton of emerald-green per week all the year round. The color is the most arsenical in general use, and, in round numbers, half of its weight may be considered arsenical. This would give a consumption in one factory of about twenty-five tons of arsenic per annum, and as there were several other makers in an equally large way of business, and a number of smaller factories, it would be safe to assume that this firm did not use one-quarter of the whole quantity used in the trade of England alone. It is therefore certain that at least one hundred tons of arsenic were annually used for paper staining until its employment was voluntarily abandoned by manufacturers, under the pressure of public opinion.—*The Architect.*

TEMPERED GLASS. — In the report of Mr. Frederick Siemens's paper read on February 26, and in the discussion thereon, I see no mention of the fact that the process of tempering glass, as carried on at the Dresden Glass Works for the last six years, was carried on at Stockport, England, in 1877-78. On March 30, 1878, I conducted a party of students from the Manchester Architectural Association over the works, and having with me a number of samples, each six inches square, of sixteen-ounce, twenty-one ounce, and twenty-seven ounce sheet glass, had half of them tempered by the process of heating to redness and then chilling between iron tables or slabs permeated by cold-water tubes. The sheet-glass, when so tempered, only broke when the weight fell three times the height (or nine-fold percussion) required to break the usual sheet-glass, and a piece of five-eighths inch rough plate resisted a two and one-quarter pound lead weight dropped from a height of about forty feet, or three hundred and eighty-three times the percussion which broke common five-eighths inch rough plate. I used some tempered sheet-glass for windows of a mechanics' shop, and it well resisted the iron chips from the cold chisels. The manufacture ultimately failed, apparently from not being annexed to a glass-works, but being carried on as a separate business. —*J. Corbett, in the Journal of the Society of Arts.*

BASEMENT FLOORS FOR LIGHT MACHINERY. — There are many difficulties in regard to the construction of basement floors for light machinery used in textile mills, and some interest may pertain to the various methods used in the United States for such purposes. Stone floors are open to many objections on account of their irregularities, and the difficulty of keeping them in line, even when the utmost care has been taken with the earth foundation. Female employés naturally object to work in places where they are obliged to stand upon cold stone floors. There are difficulties in securing the machines to such foundations, and the repairs of machinery when placed upon them, even when resting upon plates of lead or raw hide, exceed those upon timber floors. If a timber floor is placed a short distance from the earth, the dampness will cause dry-rot unless some means are taken to secure thorough ventilation of the space beneath the floor. Earthen drainage-pipes about six inches in diameter, extending through the walls, will ventilate such a space under a small mill, but for a large building it is desirable to make arrangements for a forced ventilation by connecting this space with some department requiring a large supply of air, as the picker-room of a textile mill. Sometimes flues are built in the buttresses of the walls of mills of the more modern types of construction, and by natural draught the air is conducted from the basement, through these flues, expelling it at the upper part of the mill, near the roof cornice. In a New England mill built in 1856, a basement-floor was constructed over a ledge containing numerous fissures, through which water filtrated from the canal supplying the water-wheels. The top of the ledge was blasted off to a depth of two feet below the grade of the floor, and the space nearly filled with stone chips arranged to form blind drains for the removal of the water; above this a layer of coarse gravel, covered by a mixture of dry sand and lime, four inches in depth. The spruce floor upon this foundation has remained practically sound for twenty-eight years, a recent examination showing that the dry-rot had not penetrated the under side of the floor-plank over one-fourth inch. Concretes made of coal-tar and of asphaltum form, in combination with suitable timbers, an excellent basement floor. A floor prepared in the following manner eighteen years ago is still in good condition. The earth was excavated to a depth of one foot below the grade of the floor, and then filled in with coarse stones to the depth of six inches. Floor-timbers covered with hot-tar were set in place and fastened to heavy stakes. The space between the timbers was filled in with a concrete made of coarse gravel, coal-tar and pitch, and finished off level with the upper side of the timbers. Before the floor-planks were laid, their under sides were covered with hot coal-tar. The crude coal-tar as produced by the gas-works will not answer for this purpose, as it is not hard enough unless the volatile products are distilled from it. The pitch was added to increase the hardness of the concrete. Under the same building a similar floor was laid, with the exception that a concrete of hydraulic cement was used in place of a coal tar concrete, and the whole timber rotted beyond repair in eight years. Any kind of concrete floor which does not have a covering of floor-plank should be very thoroughly painted, for the double purpose of preventing the formation of a dust which would wear machinery, and also preventing lubricating oil from softening the concrete. In another instance a floor was laid over dry sand, with a space of about one-half inch between the sand and bottom of the floor-plank. Holes were bored through the planks at distances of four feet from each other, and melted resin poured through these holes into the space below. This floor was laid in 1872, and is perfectly sound at the present time. — *Engineering.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

314,219. APPARATUS FOR OPERATING WAREHOUSE DOORS.—G. L. Browoell, Worcester, Mass.

314,238. COMBINED CHIMNEY AND VENTILATOR.—Thomas C. Harry, Dallas, Tex.

314,243. STONE-LIFTER. — Thomas Heathcote, Allegheny City, Pa.

314,262. TRUSS FOR ROOFS AND BRIDGES.— George H. Pegram, Wilmiogtou, Del.

314,274. MACHINE FOR THE MANUFACTURE OF BRICKS.—Joel Tiffany, Hinsdale, Ill.

314,287. FIRE-ESCAPE. —Edward W. Fiegenbaum, Edwardsville, Ill.

314,309. VENTILATING-CHIMNEY. — Samuel T. Atkin, Georgetown, Tex.

314,316. DRAUGHTSMAN'S TOOL. — Theodore G. R. Christian, Philadelphia, Pa.

314,320. HEATING APPARATUS. — Seneca Dobbs, Rochester, N. Y.

314,338. CHAMFER-PLANE.—James Mander, Philadelphia, Pa.

314,340. BRICK-MACHINE. — Andrew J. Miller, Meadville, Pa.

314,343. ROCK-DRILLING MACHINE. — Henry F. Parsons, New York, N. Y.

314,350. FASTENING FOR MEETING RAILS OF SASHES.—Thos. S. Smith, New Haven, Conn.

314,355. FIRE-ESCAPE. — Ephraim Watts, Middletown, Pa.

314,367. LAND-ANCHOR.—George H. Cook, Palmer, Kans.

314,374. DOOR AND TERRACE STEP. — Essington N. Gilfillan, Fort Scott, Kans., and William J. Gilfillan, St. Louis, Mo.

314,385. HOLDER FOR LIGHTNING-RODS. — Spencer R. Lawshe, Greencastle, Ind.

314,392. ORNAMENTING WOOD.— David McMullan, New York, N. Y.

314,393. WINDOW-SHUTTER. — Frank D. Paradise, Memphis, Tenn.

314,398. MOULD OR CRIBBING FOR CONCRETE STRUCTURES.—E. L. Ransome, Oakland, Cal.

314,401.—LOCKING MECHANISM FOR DOORS. — Daniel W. Tower, Grand Rapids, Mich.

314,429. MANUFACTURE OF ROOFING-FELT. — William H. H. Childs, New York, N. Y.

314,450. BURGLAR-ALARM.—Alexander Jacobi, St. Clair, Mich.

311,157. COVERING FOR BRICK-HACKS. — James S. Lester, Atlanta, Ga.

314,462. STONE-WORKER'S LATHE.—James O. Messerly, Baltimore, O.

314,483. MANUFACTURE OF WIRE-CLOTH.— Benjamin Searles, Clinton, Mass.

314,493. SHUTTER-WORKER. — Leonard Tilton, Brooklyn, N. Y.

314,511. LEVELLING-INSTRUMENT.— Ernest A. Bostrom, Newnan, Ga.

314,514. COMBINED WOODEN SHEATHING AND LATH.—Edwin M. Byrkit, Indianapolis, Ind.

314,517. WRENCH.—Isaiah Cressey, Boston, Mass.

314,532. WEATHER-STRIP. — Daniel H. Isemioger, Bloomington, Ill.

314,546. PAINT-MIXER. — David J. Starrett, Thomaston, Me.

314,562. SAW-HANDLE.—Frank A. Buell, Brooklyn, N. Y.

314,572. WRENCH. — Jonathan Forshey and Christian G. Hirlinger, Philipsburg, Pa.

314,584. COMPOUND FOR COATING METALLIC ROOFING. — Samuel B. Johnstoo and Samuel Hunter, Coon Rapids, Iowa.

314,590. DISINFECTING APPARATUS FOR WATER-CLOSETS.—A. M. Loryea, New York, N. Y.

314,607. VARNISH. — George Reuss, Wilmington, Del.

314,608. SASH-WEIGHT HOLDER.—Jeremiah Riley, New York, N. Y.

314,617. WATER-CLOSET. — Wm. Smith, San Francisco, Cal.

314,625. CALIPERS AND DIVIDERS. — Oscar Stoddard, Detroit, Mich.

314,628. FIRE-ESCAPE. — David S. Thomas, North Platte, Neb.

314,644. DOOR-KNOB. — Joseph Bardsley, Newark, N. J.

314,670. PLUMBER'S TRAP.—Charles E. Heiss, Chicago, Ill.

314,677. FLOOR OR AREA COVERING. — Peter H. Jackson, San Francisco, Cal.

314,683. WINDOW. — Friedrich Keller, Milwaukee, Wis.

314,721. SAFETY-APPLIANCE FOR ELEVATORS. — George H. Reynolds, New York, N. Y.

314,736. ELEVATOR.—Uzziel P. Smith, Chicago, Ill.

314,738. REVERSIBLE LATCH.—William E. Sparks, New Haven, Conn.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report thirty-nine permits have been granted, the more important of which are the following: —

Geo. W. Moke, 13 two-st'y brick buildings, e s Bayard St.; 16 two-st'y brick buildings, s s Carroll St.; and 16 two-st'y brick buildings, n e Cleveland St., between Bayard and Wooster Sts.

Leander Foremen, 8 three-st'y brick buildings, n s Laurens St., commencing n e cor. McCulloh St.

Geo. Meister & Co., 4 two-st'y brick buildings, w s Division St., n of Baker St.

Matthew Rudolph, three-st'y brick building, w s Charles St., between West and Ostend Sts.

S. D. Price, 12 three-st'y brick buildings, w s McKim St., between Chase and Biddle Sts.

Thos. Slater, three-st'y brick building, e s Little Sharp St., between Baltimore and Fayette Sts.

Jos. A. Bonnett, three-st'y brick building, s w cor. Ensor and East Sts.

Boston.

THEATRE. — Contracts for the new theatre on Hollis Street have been passed, and work has begun under the direction of John R. Hall, the architect.

BUILDING PERMITS.—*Brick.* — *Tremont St., Nos.* 1285 *and* 1287, cor. Prentiss St., apartment-house, 39′ 3″ x 80′; John Miller, owner; J. E. Potter, builder.

Wood. — *Allston St.*, cor. Massachusetts Ave., stable, 18′ x 22′; Ferdinand Morse, owner; C. Skillings, builder.

Swett St., near Magazine St., manufacturing-building, 14′ x 24′; Masteo & Wells, owners.

Holbrook St., near Centre St., dwell., 32′ and 38′ x 48′; Merrick Esterbrook, owner; M. H. Fassett, builder.

Border St., No. 230, storage, 15′ x 20′; James McNeil, owner.

Elm Hill Ave., near Georgia St., dwell., 32′ and 38′ x 48′; Sarah Loring, owner; W. H. Hunt, builder.

Montana St., dwell., 32′ and 38′ x 48′; Sarah Loring, owner; W. H. Hunt, builder.

East Fourth St., Nos. 469, 471, 473 *and* 475, cor. H St., dwell., 22′ 6″ x 51′; Lyman Locke, owner and builder.

Dorchester St., cor. Unnamed St., dwell. and store, 20′ x 30′; Mary Roach, owner.

Unnamed St., near Dorchester St., 2 dwells. and stores, 20′ x 30′; Mary Roach, owner.

Commercial St., near Dorchester St., 2 dwells., 20′ x 22′ and 18′ x 42′; C. E. Ricker, owner.

Walk Hill St., near Blue Hill Ave., dwell., 27′ x 29′; Mrs. Ellen Grover, owner; John Paine, builder.

Saratoga St., No. 561, dwell., 21′ x 40′; P. M. Sullivan, owner; S. C. McCann, builder.

Brooklyn.

BUILDING PERMITS. — *Lafayette Ave.*, n w cor. Steuben St., three double and one single four-st'y brick flats, felt, cement and gravel roof; cost, corner, $15,000, and others $25,000 each; owner, Paul C. Grening, 420 Gates Ave.; architect, Amzi Hill.

Suydam St., n s, 175′ w Bushwick Ave., two-st'y frame (brick-filled) dwell., tin roof; cost, $4,800; owner, John Sperl, 228 Hewes St.; architect, Th. Engelhardt; builders, J. Armendinger and John Rueger.

Atlantic Ave., s s, about 300′ w Vanderbilt Ave., one-st'y front and two-st'y rear brick carriage-factory, tin roof; cost, $3,000; owner, George Wald, 798 Atlantic Ave.; architect, W. H. Wirth; builder, Thomas Donelly.

De Kalb Ave., s s, 100′ e Evergreen Ave., 4 three-st'y frame stores and tenements, tin roofs; cost, $3,500; owner and builder, Henry Loeffler, 189a Stockton St.; architect, Henry Loeffler, Jr.

Evergreen Ave., s e cor. De Kalb Ave., 2 three-st'y frame (brick-filled) stores and tenements, tin roofs; cost, $3,500; owner, architect and builder, Henry Loeffler, 189a Stockton St.

Willoughby Ave., n w cor. Hall St., four-st'y brick double flat, felt, cement and gravel roof; cost, $20,000; owner, Henry L. Coe, 535 Washington Ave., architect, Amzi Hill.

Seventh St., n s, 257′ 10″ w Sixth Ave., 5 two-st'y brown-stone dwells., tin roofs, wooden cornices; cost, each, $5,000; owner, architect and contractor, Alexander G. Calder, 312 Thirteenth St.

Fourth St., s e cor. Guernsey St., 6 three-st'y frame (brick-filled) tenements, felt, cement and gravel roofs; cost for all, $20,000; owner, architect and builder, Samuel Self, 142 Manhattan Ave.

Stone Ave., w s, 131′ n Atlantic Ave., two-st'y brick factory, gravel and felt roof, brick cornice; cost, $5,000; owner and architect, Darius C. Davison, 779 Halsey St.

Eighth St., n s, about 150′ e Sixth Ave., 4 three-st'y brick dwells., tin roofs, wooden cornices; cost, each, $4,500; owner and builder, C. B. Sheldon, 296 Ninth St.

Tenth St., s s, 200′ e Sixth Ave., 12 three-st'y brick dwells., tin roofs, wooden cornices; cost, each, $4,500; owner and builder, same as last.

Jefferson St., n s, 170′ w Throop Ave., 2 two-st'y brown-stone dwells., tin roofs; cost, each, $5,000; owner and builder, Wm. Reynold, 40) Jefferson St.; architect, I. D. Reynolds.

Second St., s w cor. North Third St., 3 four-st'y brick stores and tenements, tin roofs; cost for the three, $20,000; owner, C. H. Meyer, cor. North Seventh and Sixth Sts.; architect, Thos. Engelhardt; builders, Jacob Rauth and John Fallon.

Cook St., No. 25, n s, 100′ w Graham Ave., three-st'y frame tenement, tin roof; cost, $4,200; owner and builder, John Pickel, on premises; architect, Th. Engelhardt.

Quincy St., n s, 125′ e Marcy Ave., 6 three-st'y brown-stone dwells., tin roofs; cost, each, about $6,500; owner, James H. Danon, 490 Eighth Ave.; architect, I. H. Herbert.

Magnolia St., n w cor. Knickerbocker Ave., 2 three-st'y frame (brick-filled) store and tenements, tin roofs; cost, each, $4,800; owner, Elizabeth A. Williams, 108 Suydam St.; architect, Peter W. Higginson.

Pineapple St., n e cor. Hicks St., seven-st'y brick apartment-house, tin roof; cost, $45,000; owner, Edwin D. Phelps, 55 Pineapple St.; architect, M. J. Morrill; builders, P. Carlin & Sons and John S. McKea.

Seabring St., n s, 150′ e Van Brunt St., two-st'y brick factory, tin roof; cost, $6,500; owners, H. R. Worthington & Co., on premises; architect and builder, Eli Osborn.

Luquer St., n s, 150′ w Clinton St., 2 four-st'y brick tenements, tin roofs; cost, each, $7,000; owner, Mary E. Lynch, 228 Sixth Ave.; architect, I. D. Reynolds; builder, John McLean.

Central Ave., e s, 25′ n Prospect St., three-st'y frame (brick-filled(tenement, tin roof; cost, $3,000; owner, Joseph Weodel, 34 Central Ave.; architect, Frank Holmberg.

Ainslie St., No. 126, s s, 161′ w Lorimer St., two-st'y frame (brick-filled) dwell., tin roof; cost, $3,500; owner, Frank P. Naeher, Jr., 71 Powers St.; architect, Th. Engelhardt.

Maujer St., No. 179, n s, 100′ e Graham Ave., four-st'y frame (brick-filled) tenement, tin roof; cost, $5,800; owner and builder, Geo. Schweitzer; architect, Th. Engelhardt.

Adams St., No. 75, n s, 89′ e Bremen St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner, John Shanley, on premises; architect, Th. Engelhardt.

Court St., e s, 38′ 7″ s Pacific St., five-st'y brick tenement, tin roof, wooden cornice; cost, $10,000; owner and architect, Catharine A. Dunne, 556 Henry St.; builders, Burns & McCann and Freeman & Sons.

ALTERATIONS. — *Myrtle Ave.*, s w cor. Walworth St., one-st'y brick extension, also rear cellar wall removed and brick piers built instead; cost, $3,400; owner, J. Dengler, Myrtle Ave.; architect, S. Harbison; builder, P. Sheridan.

Grand St., No. 413, add two stories; cost, $5,000; owner, J. M. Richards, 208 Keap St.; architect, Wm. H. Gaylor; builders, Thos. Gibbons and Gilmore & Trevor.

Fulton St., s e cor. Boerum Pl., new stairs and alterations in rear; cost, $4,000; owners, Elizur G. Webster, et al., 622 Atlantic Ave.; architect, H. P. Fowler; builder, W. J. Conway.

Chicago.

BUILDING PERMITS.—G. Schlenger, three-st'y dwell., 224 North Sangamon St.; cost, $5,000; architect, H. Kley.

G. A. Weiss Malting Elevator Co., office, 900 North Ashland Ave.; cost, $3,000.

Mrs. M. Sanders, three-st'y dwell., 205 West Ohio St.; cost, $6,000; architect, G. Isaacson.

K. Mikkelson, two-st'y dwell., 48 Evergreen Ave.; cost, $3,000.

J. Kortle, three-st'y dwell., 39 Stowe St.; cost, $6,000.

C. E. Woolley, two-st'y dwell., 599 Fulton St.; cost, $4,000; architect, G. Gottig.

L. Witkonsky, three-st'y store and flats, 984 Milwaukee Ave.; cost, $5,000; architect, Otto.

Meriden Brittannia Co., six-st'y store, 147 State St.; cost, $30,000; architect, E. Baumann; builder, C. J. Mueller.

E. B. Sheldon, 2 two-st'y dwells., 377 and 379 Ohio St.; cost. $6,000; architects, Burling & Whitehouse.

J. Freeman, three-st'y dwell., 443 Dearborn St.; cost, $6,000; architect, W. H. Drake.

E. J. Lehman, 4 three-st'y stores and dwells., 2300-2306 State St.; cost, $20,000.

A. Wachter, 2 cottages, 1002 and 1004 Thirty-fourth St.; cost, $3,000.

E. Will, two-st'y dwell., 155 Dayton St.; cost, $2,500.

J. Dannehy, 7 two-st'y dwells., Ashland Ave. and West Taylor St.; cost, $20,000; architect, C. L. Stiles; builder, L. Daezling.

C. J. Berfeld, 2 two-st'y dwells., South Park Ave.; cost, $9,000; builder, J. Griffith.

J. Butzow, three-st'y store and flats, 526-530 Ogden Ave.; cost, $5,000; architect, L. Weber.

A. Bunte, two-st'y dwell., 267 Fremont St.; cost, $3,000.

C. E. Stebbins, three st'y livery-stable, 715 and 717 West Lake St.; cost, $12,000.

M. Gallagher, two-st'y dwell., 639 Taylor St.; cost, $2,500.

J. Lally, three-st'y dwell., 226 South Sangamon St.; cost, $5,500; architect, C. C. Miller.

Mrs. E. Bundy, four-st'y store and flats, 3743 Cottage Grove Ave.; cost, $7,000.

T. S. Wild, two-st'y factory, 110 Indiana St.; cost, $3,000.

C. L. Rasmussen, three-st'y dwell., 185 West Erie St.; cost, $6,500; architect, Rehwoldt.

F. Hacker, two-st'y dwell., 1390 Twenty-second St.; cost, $3,000.

J. Spange, dwell., 3223 Butterfield St.; cost, $2,500; architect, C. Spohr.

B. Lanbenheimer, three-st'y dwell., 37 Lane Pl.; cost, $4,500; architects, Buck & Gillispie.

L. Sterne, three-st'y flats, 172 Eugenie St.; cost, $6,000.

A. Blettner, two-st'y flats, 528 Ashland Ave.; cost, $4,200.

J. Pakorney, three-st'y flats, 155 Bunker St.; cost, $5,000; architect, P. W. Ruehl.

G. V. Hanskins, two-st'y barn, 1444 Michigan Ave.; cost, $4,000.

K. G. Schmidt, two-st'y office, 498 Webster Ave.; cost, $3,500.

A. McNally, 9 two-st'y dwells., Clark St., cor. Garfield St.; cost, $30,000; architect, J. S. Ellsbee.

F. Benslee, two-st'y store and dwell., 698 and 700 Leavitt St.; cost, $4,500.

J. Briet, two-st'y dwell., 65 Hurlbut St.; cost, $3,500.

F. Frellman, three-st'y dwell., 276 Fremont St.; cost, $5,500.

A. A. Cudell, three-st'y flats; cost, $8,000.

A. P. Upham, two-st'y dwell., 3218 Groveland St.; cost, $8,000; architect, W. Linghurst.

J. Roby, three-st'y store and flats, 315 Austin Ave.; cost, $8,500; architect, F. Keltenech.

J. Heinrich, three-st'y dwell., 197 Forquer St.; cost, $5,000; architect, J. M. Kralovec.

G. N. Hull, 5 two-st'y dwells., 351-359 South Oakley St.; cost, $15,000; architect, A. Sprague.

Chas. Lansdon, two-st'y dwell., 808 Warren Ave.; $3,000.

J. Perlberg, three-st'y dwell., 51 Union St.; cost, $6,000.

J. G. Earle, three-st'y stores and flats, 3131 and 3133 Cottage Grove Ave.; cost, $6,000.

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MR. CHARLES BUDDENSICK, of New York, whose murderous practices in regard to the plumbing of the houses which he sold to unsuspecting persons were once exposed with excellent effect in the *Sanitary Engineer*, has again been brought into public notice through the collapse and fall of a row of eight houses which he had been constructing with chips and shavings in place of bricks, and mud instead of mortar. Seventeen men are said to have been killed or wounded in the crash, and Mr. Buddensick, is, we are glad to say, held to answer for his deeds. The walls, as it appears, in addition to their other defects, had been laid in freezing weather, with ice still adhering to such bricks as the parsimony of the builder allowed him to use, and the thawing of the mass incident to the advancing season, followed by the washing out of the mud joints by a warm rain, brought about the effectual disintegration of the structure. One account suggests that Mr. Buddensick, who figures in the weekly reports as a very extensive builder, is the tool of a number of rich men who drive him to expedients which he knows to be criminal in order that their profits on the buildings which he erects may be increased. If this is so, we trust that the worst of his wealthy friends may happen to have been the owners of the houses which fell. The newspapers say that not a floor-beam or a stud remained unbroken in the entire block, so that the loss, on which there is of course no insurance, must be nearly total. As usual in such cases, an attempt is made to throw the blame on the inspector of buildings for the district, in place of the man who did the evil deed and profited by it; but it is proved that the inspector complained at headquarters of the character of the work, and unthinking prejudice should not be allowed to injure him unjustly.

AS our readers know, a bill was introduced this winter into the New York Legislature providing that the height of buildings in the dwelling-house quarter of the city of New York should be restricted to a certain limit, which was as a maximum, set at eighty feet from the sidewalk. The object of the bill was of course to prevent the erection of the great apartment-houses which tower in some cases two hundred feet above the pavement, and unquestionably shade the streets and houses north of them, and reduce, by comparison, the apparent size of the neighboring buildings. Whether this dwarfing effect would be appreciable in the selling price of the property next to such structures is more than doubtful, and the real grievance seems to be confined to the shadow cast by them, and as this seems to have been considered an insufficient basis for so arbitrary a restriction as the one proposed, the advocates of the bill have recently undertaken to fortify their position by the very doubtful device of attacking the apartment-houses themselves, and have produced evidence, in the shape of opinions by certain physicians, to show that the inhabitants of such buildings are liable to zymotic diseases from the probable opening of the joints of the drain-pipes in them, as well as to contagious disorders from the difficulty of isolating patients attacked with such maladies in them. As might have been expected, this attempt has brought out an overwhelming amount of rebutting testimony. Several of the best physicians in the city join in commending the substitution of elevators for stairs which forms one of their principal characteristics, and it is easily proved that however such buildings may shade the streets below them, those who live in them enjoy a greater amount of air and sunshine than the dwellers in the average city house. To say nothing of the advantage of being raised above the surrounding buildings, the planning of the best apartment-houses always secures outside light and air for bath-rooms and hallways, which in most city houses are dark and unventilated, while the interior space, between the front and rear chambers, which in houses is usually given up to a mass of unventilated closets, cupboards, bath-rooms, wash-basins and slop-sinks, and soon becomes the permanent abode of the insects and effluvia which are supposed to be indispensable to a city dwelling, is practically unknown in the first-class apartment-house, where economy of room, as well as better principles of planning, demand a distribution of these adjuncts to domestic life which greatly facilitates their maintenance in wholesome condition. Whether infectious diseases are likely to spread more rapidly in an apartment-house than in a block of houses we will not venture to say, but in the fire-proof buildings which should alone be constructed for the purpose there is little probability of contagion being communicated through the walls or floors, and the risk that any person leaving the patient's room will convey the infection to others by contact in the elevators and halls is no greater than that which every one encounters in riding in a public conveyance.

THE New York *Mail and Express* calls attention to the startling truth that a fire in the business district of that city approaching in extent the Boston fire of 1872, or the Chicago conflagration of 1871, might easily sweep away the entire capital and surplus of all the principal insurance companies in the country. According to the report of the Superintendent of Insurance, the aggregate capital aad surplus of all the companies doing business in the State of New York, one hundred and fifty-three in number, is a little over one hundred and seven million dollars. On this basis they carry risks amounting in New York State alone to very nearly ten thousand million dollars. Property in New York city, particularly in the business portions, is now very heavily insured, and the losses of the companies, which were less than one-fourth of the value of the property destroyed by the Chicago fire, and only about five-eighths of the total value in the Boston fire, would, in a fire in the New York dry-goods district, probably reach within a few hundredths of the entire value of the buildings and goods destroyed. The value of the goods and buildings in the dry-goods district is now estimated at five hundred million dollars, the risks on which are divided among nearly all the companies doing business in the State; and supposing the insured value to be nine-tenths of the actual value, it follows that a destructive conflagration extending over one-fourth of the dry-goods district, a much smaller area than that covered by the Boston fire, would extinguish every dollar of insurance capital and surplus in the State, with more than five million dollars deficit still remaining. Of course this is a matter for the merchants, rather than the insurance stockholders. The latter, if the value of their shares should be swept away, and the old companies dissolved, have only to subscribe new capital and start in business again, with better prospects than ever; but to the merchant, doing an extended business on limited capital, the general failure of the insurance companies to meet their obligations after a great fire would mean total ruin. All this seems obvious enough to any man of sense and prudence, and it is not creditable to the New York dry-goods merchants that, so far from protecting themselves against more than a possibility of ruin by adopting the precautions which the insurance companies, who have really less interest in them than they, point out as desirable, they have neglected and evaded them with such ingenuity and success that the underwriters are said to be thinking seriously of cancelling their policies in the district as a measure of necessary prudence.

THE new building law proposed for the city of Boston has met with delays which we hope will only serve to give the friends of good construction renewed strength and zeal, now that it is fairly before the Legislature, to urge its speedy passage. A few compromises have, in order to prevent its defeat, been made between the advocates of the bill and those who had some special reason for objecting to certain provisions, but the law retains all its best features, and will, if adopted, prove the means of saving incalculable loss and suffering to the people of Boston. By a curious coincidence, the consideration of the building-bill before the Legislative Committee began almost simultaneously with the commencement of a discussion among the merchants and property-owners of the city upon the means of securing adequate insurance upon their buildings and goods, on which the insurance companies now refuse to write policies at the full value. So serious has this question become that a public meeting was held, not long ago, to see what could be done, and the necessity has led to a movement for the formation of a mutual insurance company among the large real-estate owners of the city, who have already applied to the Legislature for incorporation. If this company should be formed, as is much to be desired, not more than one or two fires would be needed to show its members that their only chance for securing themselves against loss lay in enforcing upon each other some such rules for the safe construction and maintenance of buildings as the mutual mill insurance companies practise with such signal success; and in the promotion of this good work such a building law as that now proposed would be of the greatest service. As a rule, the great real-estate owners, relying on the sufficiency of their insurance, have been more reckless in their building methods, and more obstinate in their opposition to improved rules of construction, than any other part of the community, and a change in circumstances by which they were compelled to pay the penalty of their vicious habits of construction out of their own pockets should open their eyes so effectually to the advantages of good building laws as to send them in a body to the Massachusetts State House to promote the passage of the proposed bill, which their combined influence would readily carry through.

THE appearance of the report of the Royal Commission on the disposal of the sewage of London has been followed by the publication of a new edition of Mr. Bailey Denton's well-known book on sewage disposal, which is said by the *Builder* to contain a good deal of new and interesting matter. It is particularly noticeable that experience seems to have brought, as we should expect it would, better results in the way of utilizing sewage than had been obtained when the first edition of the book was written. Although Mr. Denton advocates and practises the employment of one acre of irrigation ground to about eleven hundred of population in the towns with whose sewage he deals, so that anything like farming is carried out under great disadvantages as compared with the perfect system of management in use at Pullman, the fields irrigated even with such excessive quantities of liquid as must come from Mr. Denton's proportion of land to sewage produce in many cases crops of sufficient value to pay a good interest on their cost. At Merthyr Tydfil, where one of Mr. Denton's most important works of sewage engineering was carried out, the profit for the year which the book quotes as an example was about twenty-five hundred dollars, after paying all the expenses. At Great Malvern the profit was eight hundred dollars, which was added to the poor fund; and at Abingdon the sewage-farm was rented by farmers for twenty-two dollars an acre. The mode of applying the sewage which Mr. Denton adopts is intermediate between the scientific method in use at Pullman and the indiscriminate flooding practised in the older sewage-farms. Although a flow nearly constant is to be provided for, he prevents it from saturating the growing vegetables by planting these on raised ridges. The sewage runs in furrows between the ridges, and soaks laterally in about the roots of the plants without covering their stalks and leaves with mud.

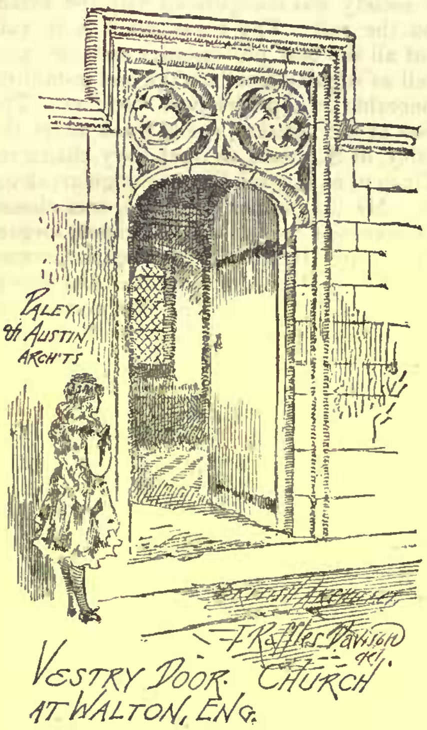
THE Missouri State Society of Architects has been constituted under the happiest auspices, the convention called for the purpose in St. Louis having been attended by about fifty members of the profession, many of them of much more than local reputation, from all parts of the State. Some of those most earnest in favoring the project of association were unavoidably absent from the convention, but sent their adhesion to the constitution, with authority to sign it for them, by letter, so that the new society was inaugurated with the names of fifty-six members on the roll. The constitution is in substance similar to that of all the best professional societies, providing for junior as well as regular membership, and establishing penalties for dishonorable or unprofessional conduct. The preliminary organization of the meeting was effected under the charge, first of Mr. Illsley, of St. Louis, as temporary chairman, and later under Mr. Tinsley, of Kansas City, as regular chairman of the convention. Mr. Arman, of St. Louis, was chosen secretary, both of the convention and of the permanent organization, and Messrs. Illsley and Herthel, of St. Louis, Carman and Van Brunt, of Kansas City, Hogg, of Hannibal, and Foley, of Springfield, were appointed as a committee on the constitution and by-laws, and were subsequently continued as the permanent committee on professional practice. The adoption of the constitution and by-laws presented by this committee, which completed the organization of the society, was followed by the election of officers in accordance with the rules, and Mr. Van Brunt, of Kansas City, was chosen President; Mr. Ramsey, of St. Louis, Vice President; Mr. T. B. Arman, of St. Louis, Secretary; Mr. Beattie, of St. Louis, Treasurer; and Messrs. McNamara, and McGrath, of St. Louis, and Cross, of Kansas City, as Trustees. The next convention of the society was appointed to be held in Kansas City on the second Tuesday in January next. We need not say that the sincere good wishes of the profession attend the establishment of the new society, and that the influence which it is in a position to exert for the good of American architects and architecture will not fail of appreciation.

ONE of the inquirers who seek legal information from *La Semaine des Constructeurs* puts a question which is answered exactly as it would be in this country or in England. The question is, whether there is any difference between the responsibility of an architect employed by a town at a salary, and that of one commissioned to carry out work at a percentage on the cost; and the answer is returned, that an architect employed by a town at a salary is not responsible for the consequences of any errors or defects in his work. A gross error may justify his immediate dismissal from his post, but beyond this he is not answerable for anything that may result from his ignorance or negligence. If damage or injury should fall upon innocent persons through his fault, they can recover compensation from his employers, but not from him, the fact of his engagement at a fixed salary carrying with it the presumption that his employers know all about his professional qualities, good and bad, and are prepared to assume the consequences of his defects as well as his merits. With the commissioned architect the case is very different. He is not, like the other, the legal servant of those who hire him, and subject to their whims and interference, but is free to prepare his plans according to his judgment, and is given, in most cases, complete control over the execution of the work. Moreover, he receives a compensation nearly proportionate to the importance of the structure carried on under his directions, and is rightfully held, in return for this, as well as for the wide discretion which the law allows him in performing his duties, to full responsibility for the consequences of failing to perform them honestly and skilfully.

THE device for receiving and delivering railway mails without stopping the trains which carry them, so familiar about our country railway stations, has just been introduced into France, where, according to the *Revue Industrielle*, it meets with distinguished approval. The apparatus for taking up mail-bags seems to be the same as with us. An electric signal, sounded by the passage of the train, notifies the post-office agent when the train arrives within half a mile of the station, and he then takes the mail-bag and hangs it on the projecting arm of a post standing beside the track. The clerks in the mail-car, before they reach the post, raise an iron arm hinged to the car, which lifts off the bag and swings it into the car. The delivery of the mail is somewhat less simple. The bag is hung out from the car, as it approaches the station, and is seized as it passes by a weighted lever, of cast iron, which lifts it from the hook on which it is suspended, and after a swing, tosses it into a net prepared to receive it.

STROLLS ABOUT MEXICO.—V.

CHIHUAHUA AND ITS GREAT CHURCH.



THE great church of the city of Chihuahua, *La Parróquia*, though commonly called the Cathedral, is really simply the parochial church, for, although Chihuahua is territorially the largest state in the republic of Mexico, its capital is not the seat of a bishop. The Chihuahua church is one of the types of the best class of Mexican ecclesiastical architecture, and the best is very good indeed. Unlike many of the notable churches of European cities, those of Mexico are generally so located as to display their good points to the best advantage. The principal cities of Mexico were laid out at the start on admirably conceived plans which have been closely followed. Nearly a century before the oldest of the New England coast towns were planted, to grow up along the straggling paths which formed the bases for their future expansion, there were cities in Mexico whose design showed all the regularity of a Philadelphia, and greater symmetry. This is probably due to the fact that the exploitation of the vast mineral wealth of the country called from the mother country many of the ablest engineers of the day, and their services were availed of in establishing the various cities of New Spain.

Therefore, as in most Mexican cities, the great church of Chihuahua occupies the finest site in the place, facing the Plaza Mayor, and occupying with its *atrio* one entire side of that square, which is the focus of the life of the town. This allows a free sight of the structure from nearly every place about it, its masses forming, from various points of view, highly interesting compositions. The lordly twin towers dominate the entire city, and may be seen for miles and miles away on the approach by railway from the north. The pretty central garden of the plaza, with its verdure, sparkling water, and bright flowers, its shrubbery and trees, and the rich architecture and noble proportions of the great church, form a combination of beauty and structural dignity which can be matched in few, if any, of our American cities.

Mr. W. H. Jackson of Denver, to whom the readers of the *American Architect* are indebted for the picture shown in the present number, has taken the best possible advantage of the opportunities afforded, in a way worthy of his reputation as the leading landscape photographer of America, being as deserving of the name of a true artist in his selection of subject and point of view, his adaptation of foreground to central feature, and his securing the best lighting to bring out contrasting shadows, as one working with the more laborious processes of pencil or brush.

The admirable proportions of the structure will be noted; the Romanesque basilica forming, as in most of the large churches of Mexico, the underlying fundamental idea. Note how the decoration is concentrated so as to produce the greatest possible effect, that of the main portal and the façade flanked by the absolutely plain surfaces of the massive walls that form the bases for the towers, which, increasing in elaboration as they rise, have the feeling of lightness and grace which suggests, in its aerial strivings, the spirit of the Gothic. Decoration is also concentrated about the side portals. These features are common to the class of churches of which this is a type. Another characteristic of most of the larger church structures of Mexico is the subordination of the dome to the towers, while in the minor churches, and also in some of the larger, as at Celaya, the dome is the dominant feature. But in the cathedral-like edifices the stress is usually laid on the towers. Unlike much of the later Renaissance work, the ornamentation of the Chihuahua church has not the over-floridness of design that imparts an effusive, unrestful feeling to the whole structure; while rich, it is chaste and reserved, giving the mass an air of elegant personality.

The church was built by a tax upon the products of the great mines of Santa Eulalia, twelve or fifteen miles out of the city. The discovery of these mines caused the foundation of the city. In those days Church and State were substantially identical, and the greater proportion of the public taxes went into the coffers of the former. The cost of the church is variously estimated at $600,000 to $800,000, at a time when labor was exceedingly cheap. This sum was raised by a tax of one *real*, or 12½ cents, on every *marco*, or half-pound of silver produced at Santa Eulalia, the church of which was built from the same source. The output of these mines in the one hundred and thirty years from 1703 to 1833 was about 43,000,000 *marcos*, or $344,000,000. The mines are now worked by an American company, I believe, but at present unprofitably, for the old leads are worked out; there is, of course, no knowing whether new veins may not some day be struck, with bonanzas as rich as the old ones.

The stone of which the church is built, as well as the greater part of Chihuahua, is of volcanic character, a porous *tufa* of a light yellowish-brown, carving easily and hardening with exposure. The plain surfaces of the walls are white-washed, contrasting with the warm tone of the carved stone-work. There are numerous bells in the towers, all pleasant-voiced except one of the largest, which gives forth a discordant clangor since in 1866 it was pierced by a cannon-ball fired by the Republican troops outside the city when it was held by the Imperial forces, who had a battery upon the church roof. The interior is impressive with its spaciousness and fine proportions, but is rather bare.

Chihuahua, is interesting as being the first typical Mexican city which one sees on entering our neighboring republic from the north, over the Mexican Central Railway. Although, when one has made the tour of Mexico it seems a rather dull and almost frontier-like place, it makes a most vivid impression when seen under the foregoing circumstances. After our flimsy western towns it has an air of striking solidity and finish. It has the appearance of a genuine capital, designed as an important centre. At the height of its mining prosperity, towards the end of the past century, its population is said to have been 60,000 to 80,000. The effect of the broad shady pleasure drives, or *paseos*, in the outskirts, with carved stone benches lining the way, and the water, crystal-clear, running freely through the streets, is most pleasant. There are many picturesque bits in the way of quaint chapels, carved house fronts, and arcaded courts with vines and flowers. The chapel, or *sanctuario*, of Our Lady of Guadalupe, a mile or so out of town, and approached by a beautiful avenue of cotton-woods, or *alamos*, is a fine example of its class of architecture; its beautiful dome, dazzlingly whitewashed, has a most brilliant effect against the clear blue sky. The bath of El Jordan, with a chapel tower reflected in the water above the other end of the long stone basin, is a sight well worth seeing, as is also the fine market-house of La Reforma. The new state palace, recently built, is an interesting example of contemporary Renaissance. This faces the plaza near the mint, where the patriot Hidalgo, the father of Mexican independence, was shot with his companions, Allende, Aldama and Jimenez, by the Spaniards, on July 30, 1811.

The railway has given Chihuahua a considerable impetus, and caused various business and manufacturing enterprises to be established there, with the prospect that the city may have a renewed prosperity and steady growth as a business and mining centre.

SYLVESTER BAXTER.

SANITARY PLUMBING.—XXXIII.[1]

SHOWER-BATHS.

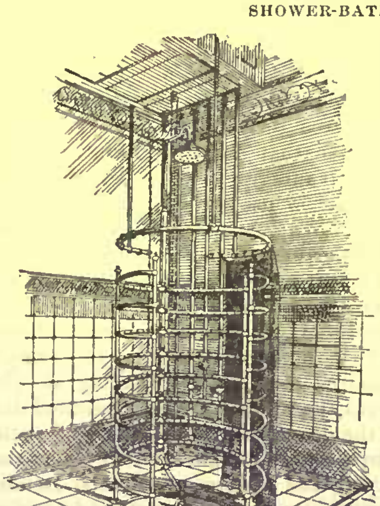


Fig. 265.—Shower-Bath.

FIGURE 265 represents a shower-bath. It stands free in the corner of the bathing-room, which has a dished or sunken floor to receive it. Jets are arranged on all sides, as well as above and below.

The shower-bath is an agreeable luxury for summer use, but for winter houses it is not so much to be recommended. The shock produced by sprays of cold water upon the body standing inactive is dangerous, and the use of warm water in the shower-bath in winter, without intelligent precautions, is also objectionable. For these reasons shower-baths are now seldom used in city houses in the North.

The usual form of shower-bath consists in a single rose-nozzle arranged overhead to throw perpendicular jets downwards. There are, however, a very great variety of forms and arrangements of shower-bath in use. Sometimes, in combination with the simple rose-nozzle above, a lower nozzle is provided with a rubber hose in such a manner that the lower jets may be applied in any desired direction. Sometimes the end of the bath-tub is raised high enough to enclose the shower-bath as in a niche. Lateral as well as perpendicular jets may be used within this niche, in which the bather may sit or stand. Sometimes the rose-nozzle is furnished with special "needle" outlets, throwing strong, sharp jets in addition to the drops from the

[1] Continued from page 293, No. 469.

sprinkler. To give varying pressure, the cistern is sometimes hung in such a manner that it may be raised or lowered at will by means of pulleys.

Figure 266 illustrates the manner in which the overflow passage of a bath-tub may become foul. Col. Waring, in his article on "*The Principles and Practice of House-Drainage*," in the November and December numbers of the *Century* for 1884, speaking of concealed overflow passages, says: "They are practically never reached by a strong flushing stream, and their walls accumulate filth and slime to a degree that would hardly be believed . . . . they are more often than any other part of the plumbing-work, except the urinal, the source of the offensive drain smell so often observed on first coming into a house from the fresh air. . . . It will perhaps be instructive to illustrate by a diagram the reason why the usual hidden overflow is so objectionable. . . . If we suppose the tube to be filled to the level of the overflow, and its waste-plug to be removed, the water will immediately rise in the overflow-pipe to very nearly its height in the tub. It is of course impregnated with the impurities of the water in the bath. Furthermore, the lighter particles of organic matter flowing through the waste will, some of them, rise by their levity into the overflow-pipe. The water rushes up into this pipe with much force, but it descends only very slowly as the level in the bath descends, so that at each operation there is a tendency to deposit adhesive matters to the walls of the pipe. What is so deposited decomposes and escapes, little by little, in a gaseous form, through the perforated screen, into the air of the room. The amount of these decomposing matters is somewhat increased, though probably not very much, by floating particles passing through the screen when the overflow is performing its legitimate function.

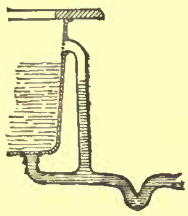


Fig. 266. — Bath-Tub with hidden Overflow-passage becoming foul. [From the *Century Magazine* for Dec., 1884.]

"This is the simplest statement of the proposition, and this is perhaps the least objectionable form of hidden overflow. Where the waste-pipe is closed at the bottom of the overflow, by a plug or valve attached to a spindle rising through the overflow-pipe — a very favorite device with some plumbers — the difficulty is in every way aggravated, and the amount of fouled surface is much increased. The inherent defect here illustrated attaches to every overflow of this general character connected with any part of the plumbing-work. In the case of a bath-tub it may very easily be avoided, as shown in the next diagram."

Col. Waring then illustrates and explains the ordinary stand-pipe arrangement, and says: "Unfortunately such a substitute for the ordinary overflow is not applicable to wash-bowls as now made. It may be made available for pantry sinks if the pipe can be so placed in a corner as not to interfere with the proper use of the vessel. If its universal adoption for bath-tubs could be secured, a very wide-spread source of mild nuisance could be done away with. Fortunately it is far cheaper than any arrangement for which it is a substitute. It is one of its incidental uses that it enables us to get rid of the dirty chain attached to the ordinary bath-plug."

The size of the trap for bath-tubs should never exceed that of the outlet and waste-pipe. A one-and-one-half inch trap is large enough for any bath-tub or wash-basin. The proper size for traps and waste-pipe of different fixtures is a matter which is very little understood. This ignorance has its origin in the faulty construction of the outlets, which are always entirely too small. A very simple and self-evident rule is that: *No trap, except a water-closet trap, should be larger or smaller than the waste-pipe at its most contracted point, and no fixture outlet should be smaller* (*in its clear water-way*) *at any part than the trap.* In no other way can the pipes and traps be properly flushed, nor the fixtures emptied with the desired rapidity. Hence, since we find the best size for waste-pipes for all lavatories is one-and-one-fourth inch or one-and-one-half inch in inside diameter, except in certain cases hereafter to be referred to, no traps should be greater or smaller than this. Moreover, it is very important to bear in mind that the measure of a trap is the *diameter* of its inlet and outlet pipes *at their smallest part.* If we examine the drawings of the different traps in our chapter on this subject, we shall see that they are drawn to a substantially uniform scale, and that the scale adopted is *the smallest diameter of the inlet and outlet pipe.* This diameter is uniform in all the drawings, and we have thus a clear idea of the actual relative sizes of these traps. The usual practice is very different from this. Traps are arbitrarily measured without regard to their real discharging capacity, but generally from the diameter of the inlet-pipe at its upper end, which is in most cases much larger than the smallest part of the trap. Many traps are sold as one-and-one-half inch traps which are contracted at some point to seven-eighths of an inch or even five-eighths of an inch. The size of a trap, then, is evidently the size of its smallest part, since this part governs its capacity for discharge.

Guided by these principles we have the following rule: *The discharging capacity of the outlet of every fixture should be great enough to fill its waste-pipe "full-bore," and the size or capacity of the trap should equal that of the outlet.*

PANTRY SINKS.

Pantry sinks, like bath-tubs, may be classified in the same manner we have classifiedwash-basins, and here, again, the open stand-pipe overflow is by far the best and most convenient form. These sinks should be constructed of tinned and planished copper weighing from sixteen to twenty ounces to the square foot. Iron and earthenware sinks are made, but they are objectionable as exposing the dishes and glass-ware to greater danger of breakage. For this reason, also, cherry slabs are preferable to marble.

The waste-pipe should never exceed one-and-one-fourth or one-and one-half inches in diameter, and the outlet should have a capacity large enough to fill this pipe full-bore. The sink should be trapped with an unsiphonable trap of the size of the waste-pipe.

There are plumbers who still ignorantly insist that a pot-trap is suitable for sinks on account of the formation of grease. Let us examine the manner in which a pot-trap deals with this material. Does it collect the grease and preserve it in its body until such a time as it may become convenient to remove it, or does it in some way alter its chemical constitution, so as to deprive it of its power to clog the drains? It is evident upon the slightest reflection that it can do neither. It is not large enough to materially cool the grease nor to retain any considerable amount in its receiver. It could not intercept as much grease, even if it were completely stuffed up with it, as would pass through the sink of a large establishment, hotel or club-house in a day, or of a small house in a fortnight.

The outlet arm leaves the body of the trap very near its top; as near as the solder jointing will allow. Hence, since grease is lighter than water, it will rise to the top of the trap, and the first that collects there in any large quantity will necessarily obstruct the passage of the water. The trap can only retain in its body the small quantity of grease which would fill the corners remote from the outlet arm, as shown in Figure 267. The heavier matters carried into the trap along with the grease fall, on the other hand, to the bottom. These matters consist of bits of meat, bone and vegetable. They form a foul sediment on the bottom of the trap, and rapidly putrify. The force of the water is generally sufficient to keep a passageway open for itself for a considerable length of time. Hence, after the corners have become filled with the black and rotting mass, the grease will pass through this trap exactly as it would through an ordinary S-trap. Having no proper tools to unscrew the tightly-sticking clean-out cap, the owner, after vainly hammering at and disfiguring the brass-work with such unsuitable instrument as he can lay hands on, is obliged to send for the plumber.

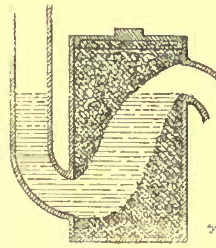


Fig. 267. — Pot-Trap under Sink.

In short it stands to reason, and is borne out in fact, that an ordinary pot-trap has really no merit whatever as a sink or grease trap. It is neither large enough to cool and retain all the grease, nor small enough to let it all pass. To cool the grease enough to harden it before it passes into the waste-pipes beyond the trap requires a large cesspool or regular grease-trap. In many cases it is better to dispose of the grease by sudden and powerful flushing. The best apparatus I know of for this purpose is the Dececo Flush-Pot, which is nothing more than a sinkage with strainer in the bottom of the sink, so arranged as to hold the waste-water until it may be discharged like a flush-tank, to scour the pipes and hurry away the grease in an irresistible torrent to the drains, its use presupposes care on the part of the servants. But when the flush-pot becomes more widely known its proper treatment will follow.

Many plumbers are very fond of the pot-trap, just as in old times they were fond of its near kindred, the foul D-trap, and, until lately, of the S-trap, because they were able to make them by hand in spare moments on a "rainy day." But in the long run what is best for the public is best for the plumber. Every additional complication of the plumbing, and everything which detracts from its convenience, safety and reliability, diminishes the amount of plumbing the public will allow in their houses, casts discredit on the art, and distrust on the plumber.

Pot-traps, like S-traps, are, however, now also made by machinery. Moreover, new conditions have originated new occupation for the plumbers' spare moments on "rainy days." The use of the flanged iron soil-pipe furnishes him with this desideratum. The lead rings for the joints are cast in the plumber's shop, as occasion demands, in small, simple moulds furnished by the manufacturers for the purpose. The plumber casts, in leisure moments, a stock of these rings large enough to last him through the busy seasons, and finds no reason to complain of the machine-making of the pot-trap. Ultimately it is probable that the S-trap, except for water-closets, and the pot-trap, machine as well as handmade, will disappear from good plumbing work altogether.

LAUNDRY-TUBS.

Laundry-tubs are made of wood, soapstone, galvanized-iron, enamelled-iron and porcelain. Wooden tubs should only be used in places where their use is constant; otherwise they shrink in the intervals of disuse, and become dirty and leaky. Soapstone sinks are most widely used, on account of economy and their general serviceableness.

The handsomest and best, as well as the most expensive, are the heavy porcelain trays. The waste-pipe should not be over one and one-half inches in diameter, and the outlet from each tray should be large enough to fill this pipe full-bore.

No pot-trap should ever be used.

THE DELLA ROBBIAS.[1] — IV.



From the Frieze of the Hospital at Pistoja, by Giovanni Della Robbia. (From *L'Art*.)

ONE more word about Andrea Della Robbia, ere we pass to his sons and successors.

He further innovated upon Luca's practice by using at times more than one plane in his reliefs. When this is very discreetly done, as, for instance, when in some of his smaller works he puts the Virgin and Child in high relief in the foreground, and a group of angels in lower relief above; that is to say, when there is no attempt at illusory, material perspective, but merely what we may call a sort of imaginative, ideal perspective, then indeed the art is pure and the result enchanting. But occasionally he essays the utmost pictorial diversity, as in a reredos representing the Nativity, which is now at South Kensington. Such efforts were far less justifiable in his glazed clay than they were in Ghiberti's bronze, which might be so much more delicately wrought. And the help he had from polychromy and from details that were merely painted, not modelled, did not suffice to win his battle.

Portraiture in enamelled clay he seems to have rarely attempted; when he desired its effects, he wisely left at least his faces uncolored and unglazed. And then he showed himself to be possessed of his full share of the current gift for realistic yet artistic likeness-making. Nothing could be more living, more full of character, than the heads in the "Meeting of St. Francis and St. Domenic," in the tympanum of the loggia of St. Paul's Hospital in Florence, and the work has also a tender beauty of sentiment and a noble simplicity of line which seem like an echo of Luca's mood.

It is not wonderful that the works attributed to Andrea Della Robbia should be so endless, or that their actual authorship should be so often undecipherable; for he lived to be ninety years old (dying in 1524), and had five sons, as well as numerous other followers, working in his atelier. Of these five sons, two became monks under the preaching of Savonarola, but probably did not quite abandon the practice of their craft. Another, named Luca, journeyed to Rome and is known to have laid in the Vatican many enamelled pavements, of which but the scantiest traces now exist. Among them was the flooring of the loggie, executed under Raphael's direction and after designs from his hand or his scholars'. But these pavements and certain vases, etc., which are believed to be Luca's, are merely painted, not modelled in relief, and so our authors with justice call him a potter, not a sculptor like his brethren.

Girolamo Della Robbia's name is chiefly identified with his work in Paris, whither we shall follow him in a moment. But the greatest sculptor among Andrea's sons was Giovanni — the greatest and most famous, though he died but four years later than his father, at the age of sixty, which may be counted young for one of these patriarchal Della Robbias. Many of his works are signed, an innovation which doubtless proves that the enamelling process was no longer a family secret, that it was now found expedient to give a "Della Robbia" some certificate of authenticity.

Messrs. Molinier and Cavallucci believe that they can trace a gradual but radical change of style in Giovanni's work. In the first period of his life he was entirely under his father's influence, that is, under the transmitted influence of Luca. Nothing therefore need be said, I think, of his earlier productions, for which a beautiful fountain in the sacristy of the Florentine Cathedral may serve as a type — a fountain which, as we might expect, is often attributed to Andrea, and even to Luca himself.

But in his second period Giovanni breaks with the family traditions, with those traditions of plastic simplicity and sweet Christian sentiment which had already persisted so marvellously long, embalmed as it were in the family process. The work of this period varies much, Giovanni's desire for independent expression leading him now to success and again to failure. Great haste is sometimes evident, as, for example, in the admixture of merely painted motives with those that are enamelled. Often the conception is cold and constrained, and the full polychromy, which is characteristic of Giovanni's later period, adds a touch of confusion instead of clearness. As a striking example of this period I may note a great polychrome tabernacle which stands in the Via Nazionale in Florence, but is better to be appreciated, perhaps, in the delicate etching that forms the frontispiece to Messrs. Molinier and Cavallucci's book than in its own form, since it is almost concealed by barriers of wire netting and grimy glass.

The central relief shows a Madonna and Child, with saints on either hand, and above, angels bearing a crown. But this relief is no longer of paramount importance: is almost crushed by the elaborateness of the borders. The inner border contains, below, life-size figures which are neither quite combined with, nor quite disassociated from the middle group; above these it shows half-lengths of angels, and the God-Father bends from the crown of the arch. Outside again is a second border with statuettes and floral motives and heads of ecclesiastics in the most prominent possible relief. The whole effect, florid and overladen, cannot be called successful, whether we judge it from a strictly sculptural or from a decorative point of view. There is no clearness, no unity in the conception, and but little artistic feeling in the execution or in the application of the color. And the lack of coherence is increased by the suppression of architectural factors. We realize the errors of its treatment when we compare this tabernacle on the one hand with those where Andrea Della Robbia sets a well-composed relief in a purely architectural framework, or on the other hand with those of Gothic origin, which are nearly akin to it in scheme, yet in the borders of which the artist always supports and unites his figures by the help of architectural motives.

But Giovanni gradually worked himself free from his period of embarrassment and confusion, and showed himself finally as an artist consummately clear in conception and single-eyed in aim, though an artist of a very different stamp from the previous Della Robbias. That is, we may affirm as much if he really was the author of the famous frieze on the Ceppo Hospital at Pistoja. No documents exist which confirm or deny the fact directly. All we can say is that popular tradition assigns the work to the Della Robbias, and that Giovanni was certainly in Pistoja in the year 1525, while the foundations of the hospital were laid in 1519, and the date 1525 occurs on one of the spandrel medallions, and again on the corner of the building itself. Lübke and many other writers speak of Andrea as its projector, a manifest impossibility when we collate our dates; but others go so far as to deny that any Della Robbia should be given the credit. It seems impossible, however, that so vast an undertaking should have been so successfully carried out elsewhere than in the atelier of our great dynasty of enamellers. Nor does it seem as though Giovanni could just at this time have been in Pistoja for any other purpose. Messrs. Molinier and Cavallucci, after careful research, deem Giovanni's authorship all but certain, granting, of course, that he must have been largely helped in the matter of execution.

The front of the hospital consists of a deep recessed loggia or porch, scarcely raised above the level of the street, and enclosed by a row of slender columns supporting wide, round arches, in each spandrel being set a large circular enamelled medallion. Above these, along the whole façade, runs a frieze of almost life-size figures, which is divided into six compartments by pairs of pilasters, very slight in projection, between each pair standing a single figure in high relief, emblematic of one of the cardinal virtues. These figures are idealistically treated, and though we may find in them some slight touch of self-consciousness, yet they have much dignity and feeling, showing once again, I think, the perennial influence of Luca. It is not in them, however, nor in the spandrel medallions — which are evidently scholars' work and good only in their borders of heavy fruit and foliage, but in the main reliefs of the frieze itself, that our interest centres. And here there is indeed no trace of Luca, unless we see it in the strictly legitimate use of a single plane of relief. Luca's grace of line, his feeling for "style" in composition, his idealism in sentiment — all these have disappeared in favor of the most direct and simple realism. If we look for pure plastic beauty, we

[1] Continued from page 175, No. 485.

shall find it only in one or two isolated figures. But if we look for an unflinching portrayal of individual truth, then indeed we have come to the right place. The theme is the Seven Acts of Mercy, personified by the ministrations of ecclesiastics to the sick and needy, a subject in which realism certainly had a sympathetic field prepared for it. The simple, unadorned truthfulness of its expression can hardly be described, and the diverse and marvellously expressive figures strike one as being the directest portraiture. The realistic effect is heightened, moreover, by the use of full polychromy in all portions save those which represent flesh, and just as much by the very fact that these are left in the unglazed clay which comes very near to the hue of Nature, and permits a very complete and incisive kind of execution. It is indeed a wonderful piece of work; wonderful not alone or chiefly in the triumphant use of the difficult material, but still more in the way an unadulterated, almost homely standpoint of Niccolo Pisano, three centuries before. With Andrea Sansovino the antique form and perhaps the antique sculpturesque feeling were more perfectly reproduced than they have ever been, before or since, while the decline marked by the substitution of alien classic for national Christian subject-matter (and typified by Jacopo, the younger Sansovino) was not yet strongly perceptible.

If Luca's Madonnas were out of date, so too were the realistic portrait-statues which Donatello had baptized with imaginative names. Even Benvenuto Cellini, who of all sixteenth-century sculptors (except the sculptor of our frieze) showed the strongest realistic impulse, did not show it by any means unmixed with a classicizing imitativeness. Even his "Perseus" has no affinity with the simple, unadulterated realism we see at Pistoja; nor, on the other hand, has the frieze any least fellowship with such work as Mazzano's. Its realism is not of a decadent, exaggerated, offensively self-conscious



From the Frieze of the Hospital at Pistoja, by Giovanni Della Robbia. (From *L'Art.*)

realism in conception has been joined to a purely sculpturesque way of treating the oft-misunderstood and much-abused relief.

When we consider all these qualities, and remember, too, that no decorative accessories whatever are introduced to assist the effect of the figures, but that the dividing pilasters are extremely simple and inconspicuous, and that the reliefs are framed above and below by mouldings so severe as to be actually bald; and when we think of Giovanni Della Robbia's other works, we do not marvel that his authorship of this has seemed to many critics doubtful. Nor does later work of his exist, to help us read the riddle; he must have died even ere this one was completed.

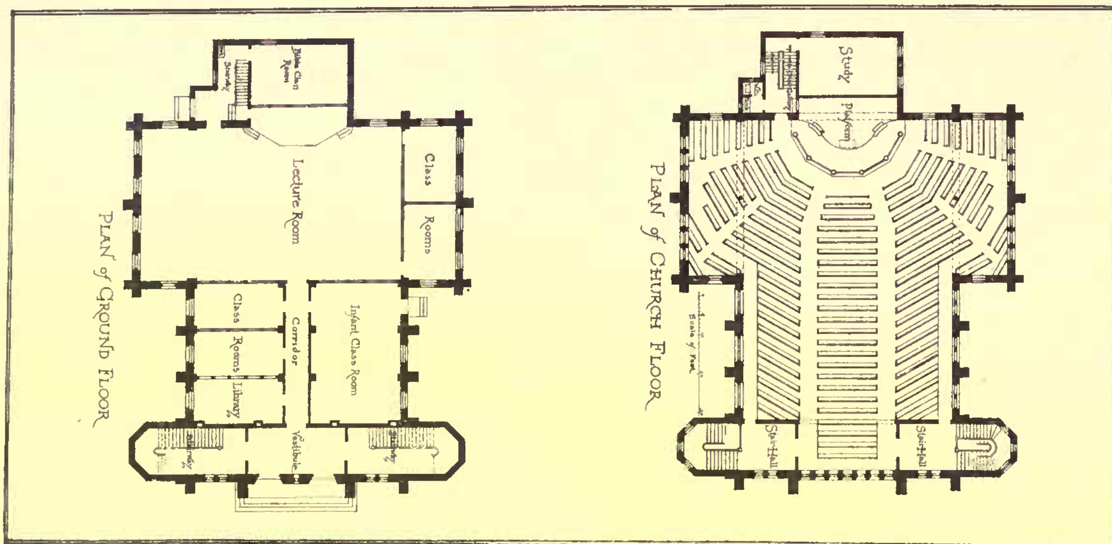
Messrs. Molinier and Cavallucci think that the implied total revolution in his art was a thing to be expected, was but an inevitable yielding to the influences of his time; but to me such an opinion seems hardly borne out by history. It is true that the spirit which sort, but purely natural, almost *naïf*, yet self-restrained; in a word, admirably artistic where Mazzano's is brutally theatric. It would not have surprised us in the least had we here found Giovanni Della Robbia throwing off the family traditions to become a classicizing idealist; for in fact we can distinctly trace such a tendency in many works of his middle period; in the large saints' figures of Santa Maria at Ripa, for example, and in certain medallions that are preserved in Florence and at South Kensington. But it does surprise us, and all the more after this last recollection, to find him turning about once more and becoming so downright, uncompromising — I had almost said prosaic — a realist as the artist of Pistoja. But, after all, if the frieze does not show the "spirit of the age," but, as I cannot but think, a spirit in distinct contrast therewith, there is less difficulty in accepting Giovanni's authorship than in finding another father for it — a father whose realism would surprise us just

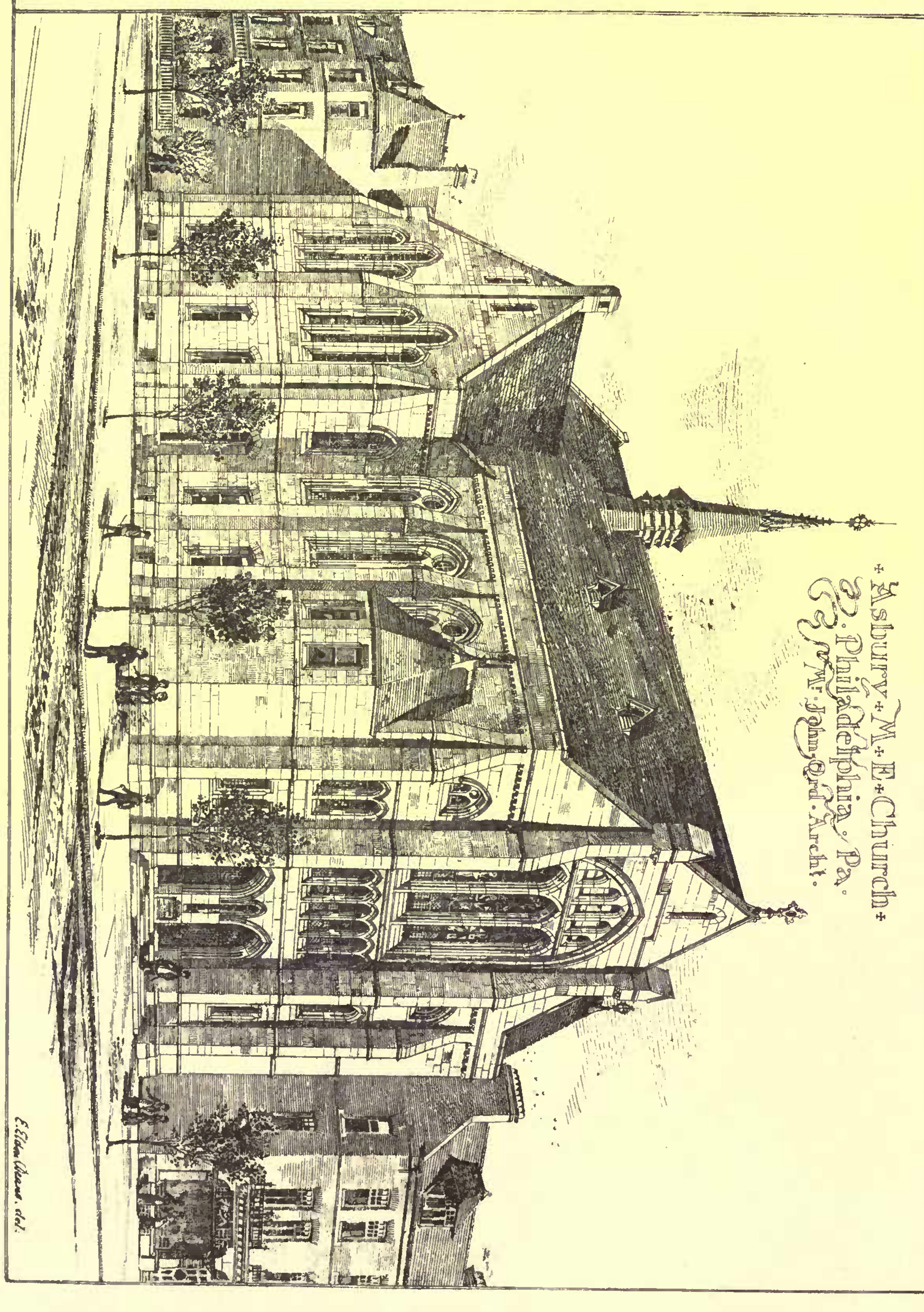


From the Frieze of the Hospital at Pistoja, by Giovanni Della Robbia. (From *L'Art.*)

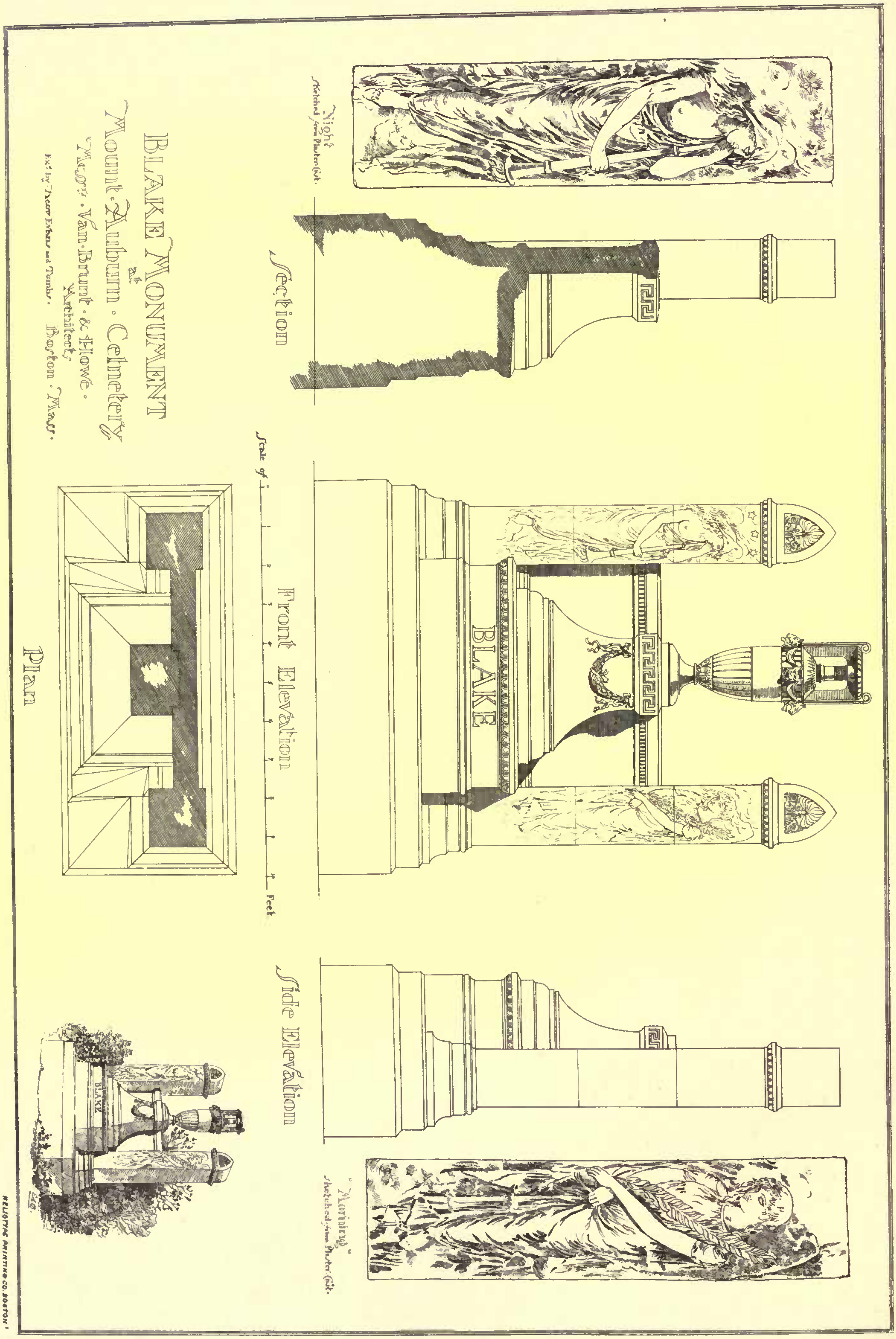
Luca personified had long been extinct, and that some radical change of aim and manner might long since have been looked for in his successors. It is true, also, that all through the fifteenth century those who came after Luca, Ghiberti and Donatello had most often followed Donatello, had very often showed an ultra-realistic tendency. But this period, too, had passed away; Mazzano, who in his melodramatic groups of unglazed terra-cotta had carried a corrupt realism to its utmost possible limit — very far outside the limits of good art — was indeed a contemporary of Giovanni Della Robbia. But another contemporary was Andrea Sansovino, and he, not by any means any Mazzano, really typifies the tendency of Italian art in the first quarter of the sixteenth century. With Andrea Sansovino the later idealism of the Renaissance found its most perfect expression — that idealism which no longer, like the idealism of Ghiberti's day, merely drew inspiration from the antique love of beauty, but deliberately based itself on the antique in aim and manner, thus returning with its enormously increased knowledge and technical skill to the as much, and whose artistic skill would be an added marvel. To no other known man can it with so much probability be assigned. And it seems quite impossible that it should have been the work of a sculptor otherwise unknown.

Long before as well as after Giovanni's death, the art of enamelling terra-cotta statuary was very widespread in Italy: so widespread and so diverse in its manifestations that it is utterly impossible to criticise more definitely than by saying, this is a good work and this is a bad one. Who may have been the author of the one or of the other can scarcely ever be ascertained, though we are naturally inclined to give the best to the Della Robbia atelier. Those works in unbroken white, which were so long called Luca's, really belong almost always to this latest time. And now the practice became common of copying former works or of reproducing them by means of casts, devices very alien to the spirit of those good old days when each of Luca's and of Andrea's works was a fresh and individual creation. Now, too, the enamellers began to copy the bronze or





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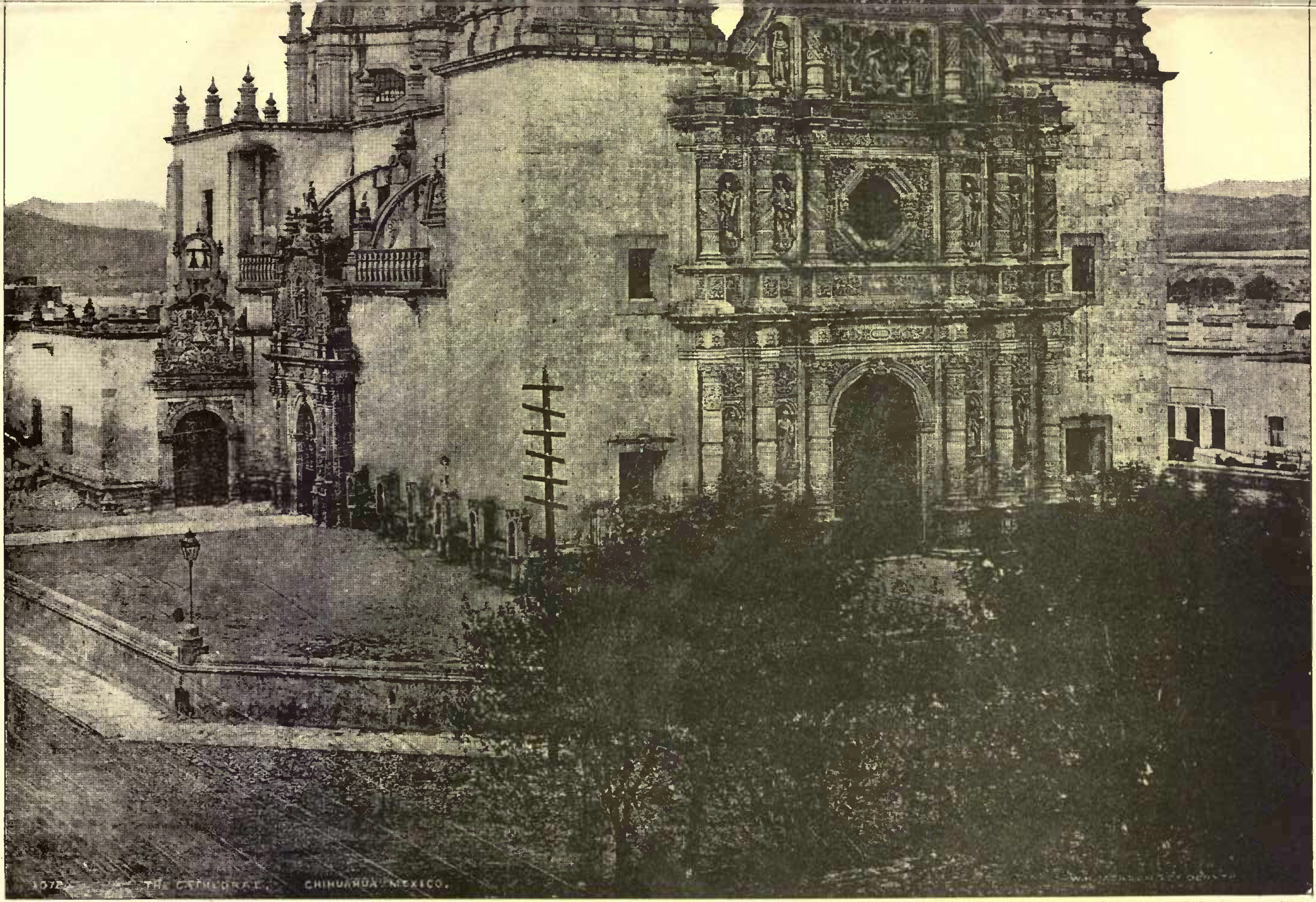
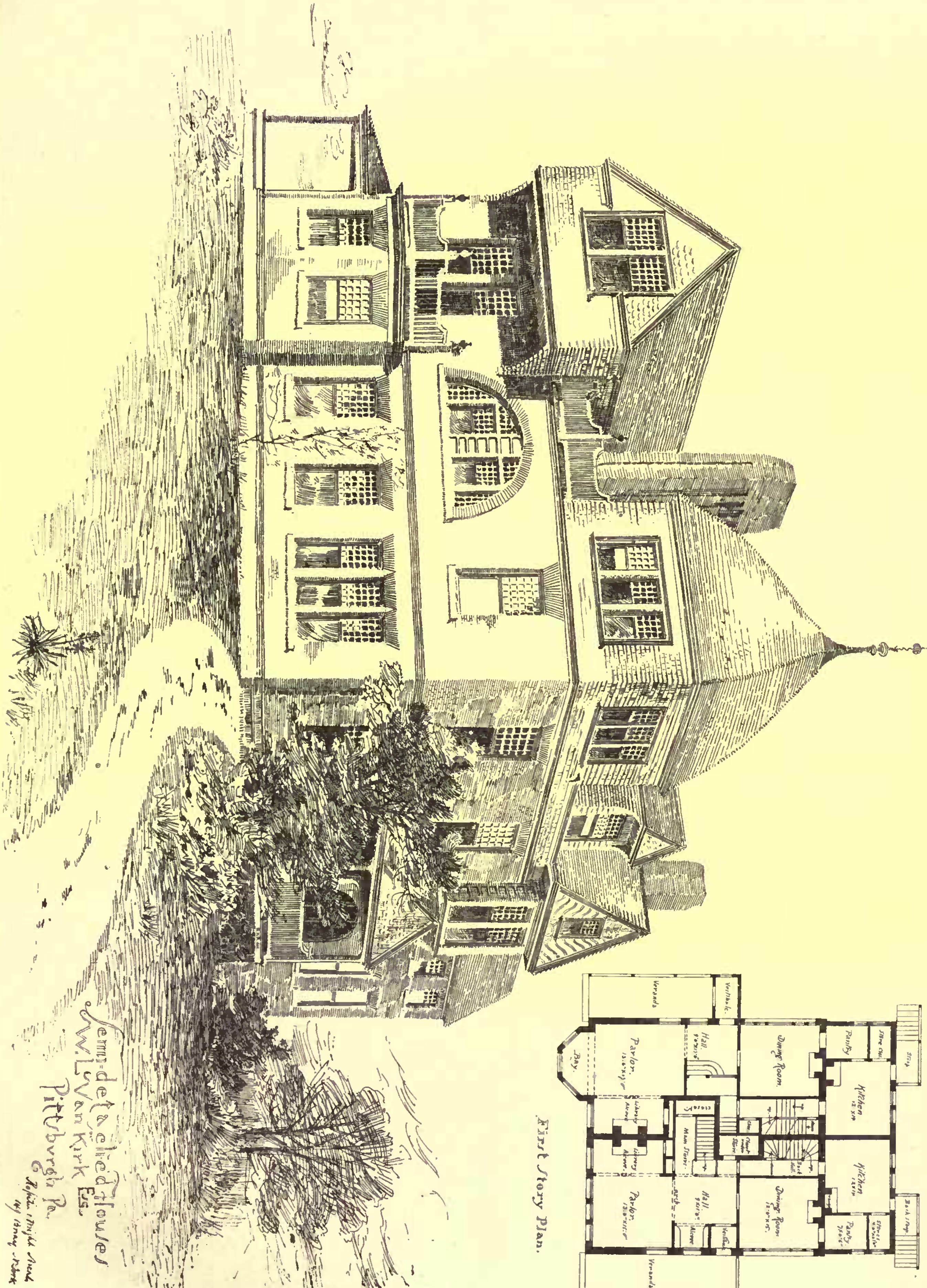


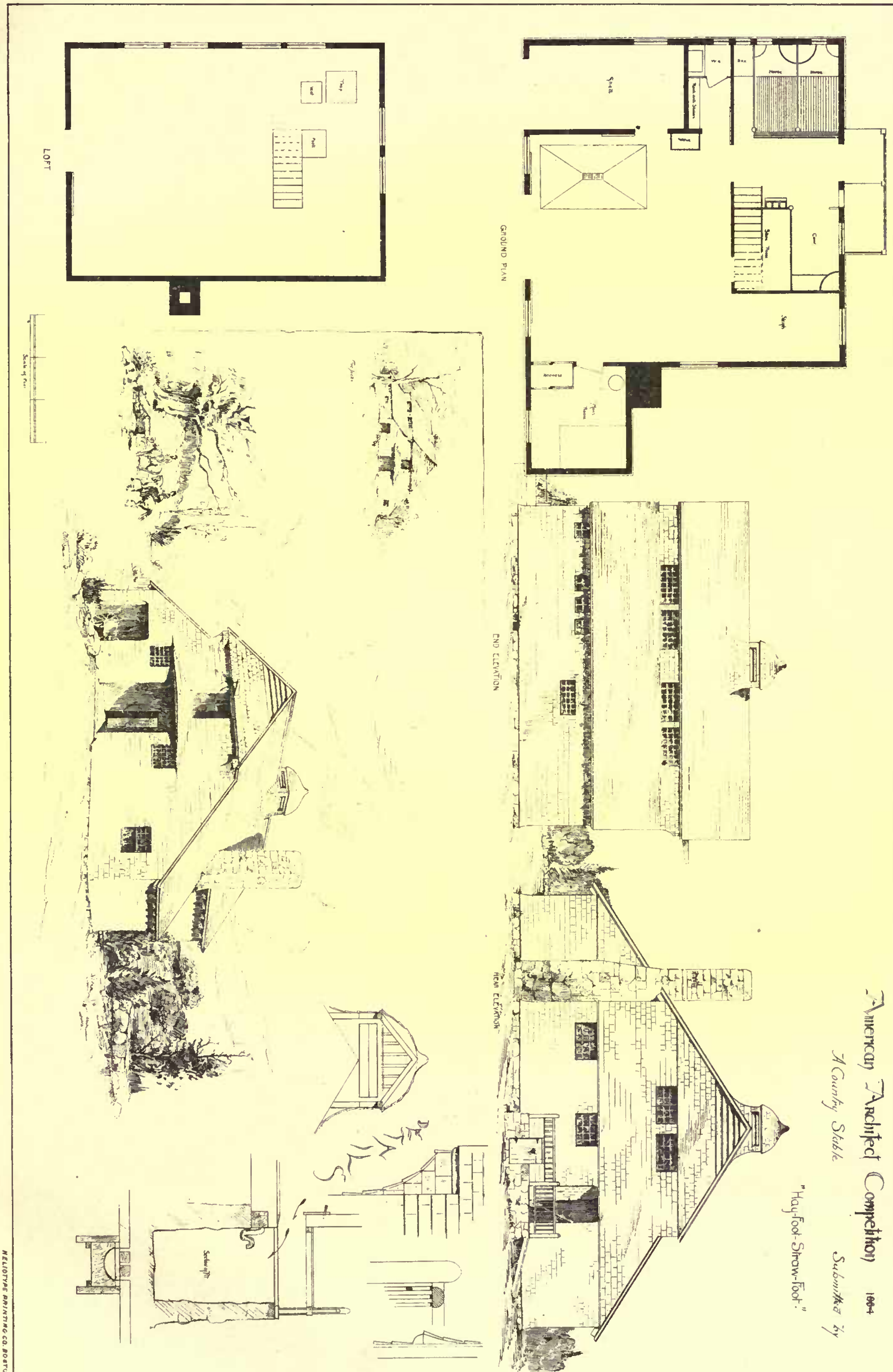
PHOTO CAUSTIC. HELIOTYPE PRINTING CO. BOSTON.

The Parochial Church, Chihuahua, Mexico.

American Architect and Building News, Apr. 18 1885 No. 486



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LOFT
GROUND PLAN
END ELEVATION
REAR ELEVATION
DETAILS
American Architect Competition 1884
A Country Stable
Submitted by
"Hay-Foot-Straw-Foot."
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marble successes of other sculptors, and even to imitate in their reliefs scenes which the painter had made beautiful on canvas. And, as we know positively in one or two cases, and may assume in very many more, other sculptors now modelled their clay and then sent it to the Della Robbias to be colored and enamelled. Is it wonderful that we have no longer a clue to guide us in our nomenclature, or wonderful that what was once so pure and beautiful an art should now have declined into a mere prolific trade; sometimes into a process which does not even deserve the name of a respectable handicraft?

After Giovanni Della Robbia's death, the only real point of interest is to be found in France. Thither went, probably in the year 1527, his brother Girolamo, or, to give the French version of his name, Jerome. He too, like so many other Italians before and after — like Lionardo and Andrea del Sarto, and Benvenuto Cellini, and Rosso, and Primaticcio — was tempted away from the distracted peninsula by the security and the munificent royal patronage of Paris. Indeed it seems probable that he was directly invited by Francis the First, as immediately upon his arrival an important work was committed to his hands. This was nothing less than the construction and adornment of that famous Château du Bois de Boulogne (commonly and most mysteriously called *de Madrid*[1]), which was one of the wonders of its age, but which to us, alas, is only known by tradition and by Du Cerceau's drawings. Nothing of the sort had been built before, and indeed nothing of the sort has been built again.

The north façade, which our authors show after Du Cerceau, was twenty-four metres in length, and was broken into three divisions, separated from each other and flanked at the corners of the building by narrow, projecting bays, which were quite plain save for small square windows and the string-courses which bound the whole structure together. The richness of the main portions was thus thrown into full relief, and very rich they look to be. Their two lower stories show arcades with round arches, and above are two more stories, where the rectangular windows are framed, apparently, by pilasters and elaborate mouldings.

Every one knows the splendid skill shown by French Renaissance architects, ere the advent of François Mansart with his innovations, in designing their great groups of high, pointed roofs and lofty chimneys, whereby they proved themselves, I should say, the masters of the world in the art of roofing secular constructions. It is therefore no slight praise to say that even for its own generation the roofing of Madrid seems peculiarly fine. It is impossible to say how much of the strictly architectural credit of the structure should be given to Jerome Della Robbia, and how much to the now forgotten "master-mason," Pierre Godier, whose name is associated with his in the commission. Nor is it easy to decide how much enamelled terra-cotta was used in the decoration; Du Cerceau's text helping but little to elucidate his prints. He leads us to believe that the fine interior features, the pilasters and great chimneypieces which he drew, were in terra-cotta, and of the façade he says: "The largest part of the enrichment of the first and second stories outside is of terra-cotta. The mass is very brilliant [*esclatante*] to the eye . . . all the more that even the chimneys and dormers are filled with work." But this last phrase does not mean terra-cotta work. For Jerome was not allowed to finish Madrid in peace. His name disappeared from the records in 1553, and he himself, according to Vasari, then returned to Florence. His brother Luca, whom he had called from Rome to help him, had already, it would seem, ended his life in Paris. At the death of Francis I, in fact, Philibert Delorme had been made *Surintendant des Batiments*, and his own book[2] tells us of his disapproval of the decorative system adopted for Madrid, and of the care he took not to continue it in the upper stories. In 1559, Primaticcio succeeded Delorme, and called in to aid him, at Madrid, the Limoges enameller, Pierre Courtois. We know that at least the decorations of the chimneys were executed by Courtois in his own material, and some remains of them are still to be seen at the Hôtel Cluny: great colored figures on a blue background, enamelled on copper and curiously hammered up from the back, so that they stand out in considerable relief. This last fact may tend to prove that Courtois strove to bring his own enamels into harmony with those of terra-cotta which Della Robbia had placed below. In 1560 Jerome returned once more to Paris, and when he died, six years later, the Château stood entire. But we do not know what part he may have taken in its completion. It is only certain that he stood well at court, being given commissions of other kinds, and being lodged in one of the royal palaces.

Returning now to the Château, we find that the spandrels of the arcades were filled by circular medallions, and that elaborate friezes, richer in the first story than in the second, ran above them. The medallions were undoubtedly of terra-cotta, but about the other details there is more question. Vasari tells us that Jerome worked in stone for the decoration of the building, but from the way in which contemporary and later writers (always speaking casually, alas! and never descriptively) dwell upon the effect of the enamelled color, it seems to me as though more parts than the medallions must have been wrought with it. Nothing exists to-day which can with any likelihood be considered as having belonged to Jerome's work upon the Château save four medallions colored in white and dull red, now in the Cluny Museum, and a few others, colored in white and violet, which are in the collection at Sèvres.

The other commissions which Jerome received during his second stay in Paris included terra-cotta decorations for the palace at Fontainebleau, which have long since perished; also, two marble figures, lost again, for the monument which was to hold the heart of Francis II, at Orleans; and finally, a figure for the mausoleum which Catherine de Medici had planned for Henry II. The queen desired that even during her lifetime her figure as lying in death should be placed beside her husband's on the tomb. The general design of the monument was Primaticcio's, and the execution was distributed among a number of sculptors, to Jerome Della Robbia's share falling the preparation of Catherine's effigy. It is certain that he received for it a payment on account, but eventually both the recumbent statutes were executed by Germain Pilon, doubtless because of Jerome's death ere his had been completed. An unfinished marble figure of the dead Catherine still exists, which in former years received different appelations, and was often supposed to be Germain Pilon's first essay for his work. But to-day, it is generally conceded that it is in truth the figure which Jerome Della Robbia seems to have left incomplete at his demise. Those among my readers to whom the Museum of the Ecole des Beaux-Arts in Paris is a familiar memory, will doubtless recollect a strange, ghastly, realistic-looking nude figure which is in truth an imaginative picture of Catherine as a corpse, designed many years before she left the world. It is interesting in itself — doubly interesting as being the last work of the last artist of what Messrs. Molinier and Cavallucci not inaptly call the great dynasty of the Della Robbias.

But, I may add, the family by no means died out with the death of its art. Jerome's many children all married well in France, and his descendants find occasional mention in history. One of his daughters became the wife of Ascanio Di Mari, goldsmith to the king, recognized even by the irascible Cellini himself as being the best among his pupils. Looking at the genealogical tree our authors furnish we find, moreover, that in Italy also honors were in store for Della Robbias. For example, one Luigi, a descendant in the fourth generation of Andrea's brother Simone, was the father of no less than three bishops. His sister married into the noble family of the Viviani, and to-day her descendants are proud to recognize her origin by calling themselves the Marquis Viviani Della Robbia. At least one of the present generation in this branch has, I believe, shown himself to be an intelligent admirer of his forefathers' art.

[In a former chapter I carelessly attributed one of the Florentine baptistery-doors to Giovanni Pisano. It is in truth the work of Andrea Pisano, the greatest among Giovanni's scholars, and the greatest of all the Gothic sculptors of Tuscany.]

M. G. VAN RENSSELAER.

[1] It seems as though, of all places in the world, Madrid must have been the last, except Pavia, which Francis the First would desire to remember or to honor. And indeed the name stands always Château de Boulogne in his official documents. Yet "Madrid" soon became the common appelation, as we see from Du Cerceau's drawings. Some writers believe it must have been given on account of a supposed resemblance between Della Robbia's decoration and the *azulejos* or colored enamelled tiles that were characteristic of certain parts of Spain.

[2] *Treatise on Architecture.*

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

COMPETITIVE DESIGN FOR STABLE, SUBMITTED BY "*Hay-Foot-Straw-Foot.*"

IN designing this stable an endeavor has been made to give it as "barny" an appearance as possible, and combine long lines with simplicity. The man's room is provided on the main floor so as to make his quarters comfortable as well as convenient. On the side of his room next the carriage-house is a glass case for the best harness. This has sliding doors on either side, so that the harness may be put in on one side and taken out from the other, thus overcoming unneedful carrying. This case is placed as far as possible from the stalls, so that the good harness is kept from the effects of ammonia. A generous closet is provided, to be used as a store-room for blankets and stable trappings. The recess for the sleigh is so arranged that the sleigh is out of the way during the summer. For the convenience of the man an earth-closet is provided. The stairs run from the stalls, so that the man may conveniently go from the horses to the loft, and in this way the carriage-room is not broken by the stairs. It is best to have the manure-pit entirely without the stable, and it has been arranged in this way, so as to keep all odors arising from the pit out of the stable. The stable is to be stained with oil of creosote, which costs 30 cents per gallon.

Mr. Ladd, of Boston, whose estimate, of $1.50 per square foot, I take, can build this stable for $1,400.

COMPETITIVE DESIGN FOR STABLE, SUBMITTED BY "*Asmodeus.*"

[See Illustrations in *American Architect*, No. 485.]

THE foundations of all inside and outside walls to be of brick. The stables and yards to be paved with bricks grouted and laid to current, and provided with iron traps, where shown on plan, connected with glazed stoneware drain-pipes, jointed in cement. Provide hopper-closet apparatus for water-closet, and connect with drains. Provide iron cistern, and lay on water to same and to closet and greenhouse, with all the necessary fittings. The manure-pit to be built of brick and to be six feet deep. Provide and fit one stone chimney-cap.

Studs to be 2″ x 4″, planed and chamfered joists (both floors) in carriage-room and over stable, 2″ x 12″; other joists, 2″ x 8″; sills, 3″ x 7″; plate, 3″ x 4″; rafters and collars, 2″ x 6″. All walls and roof to be lined outside with spruce or hemlock boarding, and all ceilings in man's rooms and harness-room, and inside walls (except in carriage-room), to be lined with seven-eighths inch second pine matched sheathing. All floors to be laid with one and one-eighth inch matched flooring. The clapboarding to be second pine. Roof-shingles spruce; vertical shingles pine, to be furred out as shown. The stable is ventilated by fourteen-inch matched-enclosed shaft, extending from ceiling to ventilator in roof. Doors in carriage-room and stable to be two and one-half inches thick, made to slide complete.

Stairs and other parts drawn to enlarged scale to be built accordingly. Cases in harness-room to have sliding-doors.

The price obtained from a responsible builder, of Springfield, Mass., for constructing the above barn complete, in accordance with accompanying plans, is $1,523.

ASBURY M. E. CHURCH, PHILADELPHIA, PA. MR. JOHN ORD, ARCHITECT, PHILADELPHIA, PA.

THIS building is now approaching completion. General facing of walls is Trenton brownstone, with finals of Bedford, Ind., limestone. Finish, inside, of yellow-pine; the benches being of ash, stained. Ceiling, thirty-six feet high in the clear, is plastered on top of principal rafters which have curved braces brought well down on the walls and rest on stone corbels. Transept arches are kept below the level of general wall-head. Windows filled with stained glass, — mostly Memorial windows. Heated by three thirty-six inch hot-air furnaces in cellar, so arranged as to draw the air required for combustion from the floors of rooms. Lecture-room and class-rooms on ground floor; and main audience-room up-stairs. The cost of the building, finished complete, ready for occupancy, will probably not exceed $50,000. Seating capacity, 900. Some slight reductions were made on cost of exterior, as shown in this perspective.

THE BLAKE MONUMENT, MT. AUBURN CEMETERY, CAMBRIDGE, MASS. MESSRS. VAN BRUNT & HOWE, ARCHITECTS, BOSTON, MASS.

SEMI-DETACHED HOUSES FOR W. L. VAN KIRK, ESQ., PITTSBURGH, PA. MESSRS. ROSSITER & WRIGHT, ARCHITECTS, NEW YORK, N. Y.

THE PAROCHIAL CHURCH, CHIHUAHUA, MEXICO.

For description see article elsewhere in this issue.

CONCRETE ROOFS AND ROOF COVERINGS.



IN treating of concrete as a material for roof and roof coverings, it may be as well to limit the subject at once to those instances in which the employment of such a material would be of practical advantage. For the ordinary pitched roof of the general run of buildings we are not likely to see concrete much employed, except in the form of concrete tiles or slabs, on account of its great weight and the consequent expense of both the roof itself and its supports. We may also, I think, lay it down as a rule that concrete, if employed, would be not only used as a covering, but would itself form part of the construction of the roof. The following appear to me to be cases in which concrete may be advantageously employed in roofs. (1) For flat roofs; (2) for all kinds of fire-proof roofs; (3) for all kinds of domes and vaults; (4) for the roofs of all buildings of a monumental character, in which great strength or durability is required.

As an example of the first kind, viz.: flat roofs, I may mention one which has come under my notice as district surveyor in my district. At Hackney, where Mr. H. M. Millar, builder, is erecting some small houses in which several ingenious applications of concrete are adopted, he forms part of the flat roof as follows: —

1. The top story is covered by joists 8″ x 3″ at one end, and 3″ x 3″ at the other, made by cutting through an 11″ x 3″ joist diagonally, so as to get fall without waste, placed about twelve inches apart; these are covered by boarding in two-and-one-half inches widths, and three-fourths inches thick, each board being one-fourth inch distant from the next one (a very important point, as if laid close they swell with the wet, spring up and break the roof). On this as centring is added two inches of Portland cement concrete as a roof covering; the concrete is made of brick rubbish ground to powder in a mill, and with one-quarter in bulk of Portland cement added, thoroughly mixed dry, and then wetted and brought to the consistency of a thick paste. It is laid on the boarding, smoothed out with a trowel, and the roof is complete. A coat of tar is sometimes added, but it is not absolutely necessary. Mr. Millar says he has had about eight years' experience with roofs of this kind, has made about fifty, and has never had a failure except in the case of some which were done during a frost. More frequently the centring boards are put under the joists, embedding them, and thus making the joists practically fire-proof. I believe this is a method frequently adopted in the roofs of artisans' dwellings in the East End and elsewhere. It is quite obvious that in buildings of greater importance the same system might be adopted with iron joists instead of wood, or any of the numerous methods in use for the construction of fire-proof floors in concrete would come in also with slight variation as useful flat roofs, and no doubt many of the members present could give examples of such application.

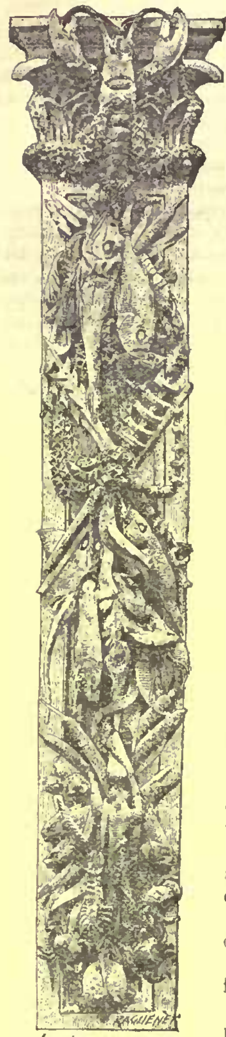
2. The same reasons that make concrete available for fire-proof floors make it also available for fire-proof roofs of all kinds. I may give an example on the black-board. Suppose a fire-proof roof be required, and it is determined to cover the building with a roof on the mansard principle. Let all the principals be formed of iron trusses, the front and back walls of the attic story being framed of suitable iron uprights, instead of the usual wooden quarterings, and let the common rafters be of iron; put boarding on each side of these rafters and quarterings to form a mould, and fill in with fire-proof concrete, so arranged as to cover and protect the iron, and you then have a complete fire-proof roof without thrust on the walls, which is neutralized by the trusses. I have noticed in houses in the course of construction in Paris, that all the roof framing and common rafters are frequently of iron, and it would be interesting if our secretary or some other gentleman equally well acquainted with French construction could tell us in the discussion if this iron framework ever has a concrete filling-in like the fire-proof floors which are so general in Paris; and also some member may possibly be able to inform us if this mode of construction has been adopted in America.

3. On the subject of domes and vaults I think I have little to add to what I have already said in the former papers above alluded to, so that I will not take up the time of the meeting by going into it, except to allude to the immense importance of the subject, and its bearing upon the whole question of style and construction in architecture. To realize this, one has only to turn to a work like M. Viollet-le-Duc's dictionary, and glance at the chapter on vaults in the article on construction, where he shows in that lucid analytical style which is peculiarly his own, how the whole fabric of the Gothic cathedral rose up step by step from the repeated attempts, after many failures, to cover in those large buildings in a fire-proof manner with stone vaulting. We know how the Gothic architects ultimately succeeded by an ingenious collection of the various thrusts of the vaults in given points, and opposing these by buttresses. Wonderfully ingenious and skillful as this method is, I think it must be admitted that it carries with it the elements of unrest, and comparatively early dissolution. In most instances, if one pier or one buttress gives way, the rest will follow at no distant date, like houses built of cards. It is to be doubted if buildings on this system, unless constantly watched and repaired, will ever attain the ages of those of Egypt and Greece, constructed on the principle of the upright support and horizontal lintel; and is it not quite possible that if the ingenious and practical designers of the Middle Ages had had at their disposal iron in large bulk, worked with the ease and facility that it is in modern times, and a strong and plastic material like Portland cement concrete to use in conjunction with it, that the problem of roofing-in large buildings in a fire-proof manner might have taken a totally different direction to the buttress system of equilibrium between thrusts and dead weight, which so characterizes Gothic vaulted buildings?

I am now trenching on my fourth heading, viz.: the suitability of the employment of concrete for roofs of buildings of a monumental character, where durability and fire-proof construction are required, and in proof of this I think I need only refer to the examples of splendid buildings erected in India, both in ancient and modern times, some of which have been described and illustrated in the *Transactions* of the Institute, and in which concrete figures certainly as the chief material in the construction both of roofs, vaults and domes. — *Alexander Payne, in the British Architect.*

WEIGHTS ON CROWDED FLOORS. — In the course of discussion at the Institution of Civil Engineers of a paper on "The Construction of Charing Cross Bridge," Mr. E. A. Cowper said he had tried the weight of a number of laborers, by weighing each man individually, and then by measuring the exact space they occupied when standing close together, as in a crowd, when he found their collective weight was fully 140 pounds per square foot. He was, however, aware that from 60 pounds to 80 pounds was often taken as a test load, but that was far below the weight of a crowd of able-bodied men. Mr. Mallet remarked that, during the building of Buckingham Palace, Mr. Nash ascertained the greatest possible load of human beings that could be brought upon a given space, with reference to the so-called fireproof floors of the palace. Within a hoop, he thought, of about 20 feet diameter, as many men were caused to stand as could be wedged into it, the last men being lowered down amongst the others. The result gave a load of 120 pounds per square foot. Mr. Hayter stated that 70 pounds per square foot was probably the maximum living load that could be crowded on a given space. Messrs. Cochrane & Co., had tried an experiment, selecting for it the tallest and most muscular men in their establishment, and the result proved that the estimate of 70 pounds was ample. Sir John Hawkshaw said he had been found fault with for assuming so much as 80 pounds per square foot as the weight of a crowd of human beings. French engineers and others were said to be content with 50 pounds to 60 pounds per square foot, but he was satisfied with 80 pounds per square foot. — *Engineering News.*

MISTAKES IN PLUMBING.



CHIMNEY-PIECE PILASTER. CONTINENTAL HOTEL. CANNES, FRANCE. ROGNAT, ARCHT. PELLEGRINI, SCULPTOR.

"MISTAKES in Plumbing" formed the subject of the closing lecture at the New York Trade-School. It is a well-known fact that many well-meaning plumbers unintentionally make mistakes, the future effect of which they, from many causes, are unable to foresee, and the idea of exposing popular errors in plumbing practice in connection with a line of instruction for young prospective members of the craft is certainly a happy thought, which may be of assistance to older operators of the ladle and cloth. Through the courtesy of Mr. Murphy we are enabled to give a general outline of "mistakes" as commonly made, and which, as will be seen, constitute "Thirty-nine Articles,' which, however, in this instance are to be avoided as being entirely subversive of the orthodox and generally accepted sanitary creed. The following is the order observed:

1. Not to carefully determine what the grade of a sewer shall be before commencing to lay the pipes.
2. Putting the pipes into a tight hole in the front wall where it enters the cellar.
3. Using T connections for branches for soil and waste pipes.
4. Tipping up traps so as to cause them to lose their seal.
5. Using larger traps than are necessary.
6. Connecting wastes from safes with soil or waste pipes.
7. Putting in a trap at foot of soil-pipe.
8. Connecting sanitary flushing closets without making proper provision for the ventilation of the traps or branches.
9. Running a vent-pipe in such a manner as to form traps, or where the overflow can enter.
10. Running the ventilating-pipes into chimneys or ventilating flues.
11. Placing traps at too great a distance from the fixtures for which they are intended.
12. The use, where it can be avoided, of pan-closets.
13. Connecting overflow of tanks directly with soil or waste pipes.
14. Having water-closets in rooms or opening into rooms where storage tanks are used.
15. Breaking joints in iron pipe, and not using proper fittings for change of direction; also using pieces of pipe as substitutes for sleeves or hubs.
16. Neglecting to trap leaders.
17. Connecting branch wastes with water-closet trap, particularly when separately trapped and vented.
18. Trapping connection for hot water from side coupling for boiler with water-back.
19. In not enlarging hot-water pipe to desired size, and in making wrong connection between the water-back and range.
20. Running "circulation"-pipe so as to form a trap or traps thereon.
21. Connecting the inside and outside of a double boiler with one connection to the water-back of the range.
22. Connecting the sediment-pipe of double boiler in such a manner as to render it possible to empty the inside before the outside boiler.
23. Neglecting to put in expansion-pipes or vacuum-valves where valve couplings are used on boilers.
24. Running the water-pipes without sufficient grade to empty them.
25. Putting up hot-water pipes without allowing for expansion, and having straight branches from hot-water pipes.
26. Using lead pipes for hot water where hot water is heated from a steam-supplied tank.
27. Using lead for lining tanks for storage for domestic purposes.
28. Using impure lead, such as old joints, etc., for calking joints.
29. Putting supply and waste pipes in inaccessible and undesirable locations where they are liable to freeze, and not sufficiently protecting them.
30. Connecting directly on supply-pipe the valves of water-closets.
31. Allowing raspings and filings to fall into pipes.
32. Taking keys out of ground key-cocks for the purpose of wiping them in.
33. Supplying bath-tubs from the bottom, thereby endangering the fouling of supply-pipes on lower stories by siphonage.
34. Putting in mains in a street without allowing for settlement and without properly blocking up under the tap.
35. Using pipe-hooks instead of metal racks and screws for supporting pipes in recesses or along ceilings.
36. Making joints with soldering-iron in place of wiping where required.
37. Using tin-lined pipe for hot water.
38. Not using a boiler of a size proportioned to that of the range, also using ranges with small water-backs.
39. Omitting to close terminations of soil and waste pipes, also the ends of Croton or supply pipes which are likely to be obstructed.

The lecturer does not claim that the above enumeration of "Mistakes" exhausts the subject by any means, but as they were carefully illustrated by blackboard diagrams, and the evil results likely to follow their introduction into a system of house plumbing pointed out with great minuteness, their consideration was well suited to bring a valuable course of instruction to a close. — *The Metal Worker*.

KIDDER'S POCKET-BOOK.

BOSTON, April 4, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — As you were so kind to notice my "*Architect's and Builder's Pocket-Book*" at so great length in your issue of to-day, perhaps you will permit me to say a few words partly in reply and partly to your readers. The book which you have so kindly reviewed was compiled to meet a want which I have long felt myself, and which I knew to be common with other architects and draughtsmen (for, though educated as a civil engineer, I am by practice and experience an architect); and also to do what little I could to promote better and more intelligent construction of our modern buildings. I *am not* desirous of "insinuating" myself into the place of Trautwine, and no one has a greater respect for his work than I; but every architect can see that it was not written for him. The profits which the author of such a work can expect to realize would be but small compensation for the labor involved in its preparation, were the work not more a labor of love than of gain. In regard to the whiskey-and-rum table (which occupies but an inch of space in the book), it was compiled from a book of tables, and its presence may be accounted for by the same reason as much other information, that while it is perhaps of no very especial interest to architects, yet it occupies but little space, and it may sometime be found useful. It is not inconceivable of an architect having a client who should wish such things stored in his cellar, or designing a building destined to contain such articles. In short, information least likely to be wanted, is oftentimes greatly needed and hardest to find, and where such information occupies but little space, I thought best to put it in.

If your critic will go into some of the country towns of eastern Maine he can see a tree growing which the people there call "fir." In regard to piling, the best information that we have must be used with great discretion, and I think that architects might gain considerable valuable information by computing the loads borne by the piles under the heaviest of their buildings, and compare results by publishing them in the columns of your paper, describing at the same time the soil in which the pile is driven, length and size of pile, amount of sinkage at last blow, etc. The same information in regard to the loads on brick piers would also be of great value. There is also a great want for more practical information on the size and shape of large chimneys, both for steam heating and for engine boilers.

In conclusion, I wish to say to your readers that in the third edition of my book (the second will soon be out), I shall endeavor to make some additions, and such corrections as may be necessary, and I shall feel grateful for any criticisms, and especially for any information or suggestions which will tend to make the book more valuable to them and more worthy of its name.

Thanking you for your kindly suggestions and criticisms, I am

Respectfully yours, F. E. KIDDER.

CENTRES FOR A GROINED VAULT.

HARTFORD, April 4, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — In describing his method of laying out the centres for a groined vault, Mr. F. E. Kidder does not seem to have read very carefully the problem as given by me. He says: "Work out by the principles of projection the form of the diagonal ribs. It will be elliptical in shape, if the vaults are segmental." Now, then, I say distinctly in my letter that the form of the diagonal ribs is to be a *segmental* arch, not elliptical, consequently the course of the soffit on the wall side will be elliptical, and it is principally the finding of *this* elliptical curve by a correct method, which induced me to apply to you for a solution of the problem. If the crown of the side arches were on line with the crown of the diagonal ribs, — making allowance for the projecting rib moulding — then it would be easy to find the true curve of the side arches by the principles of projection; but this difference in height, as stated in my letter, is what causes the difficulty of finding this curve.

Hoping I have made myself sufficiently clear, I remain,

Respectfully, yours. A. VAULT.

BOSTON, April 9, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I assumed that "A. Vault" referred to the wooden centre, for three reasons: 1. It is not customary to assume the

intersection of two vaults, and make the vaults to fit. 2. He used the word centres, and I thought that if the diagonal ribs were segmental, the wall arches would be irregular curves, and hence would have no centre. 3. His sketch was not drawn right for the diagonal ribs to be segmental. I will now answer his inquiries, in two ways, one of which, I hope, will be satisfactory.

Problem 1.—Given the diagonal ribs of a groined vault, with all the elements in the soffits of the vault, straight lines and inclined at a given angle with a horizontal, to find the curve of the wall arch.

Solution. — Draw the plan Figure 1, with the dotted lines *a a′*, *b b′*, etc. Draw Figure 2, giving the true curve of the intersection of the vaults. The base, *B e*, will be, of course, equal to *B e′*, Figure 1. I have assumed that the diagonal ribs are 6 inches below the line of intersection of the vaults, so that the height is 6 feet 6 inches.

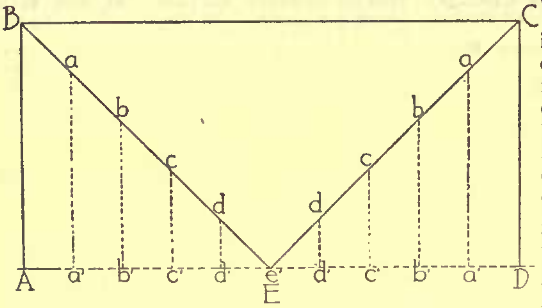
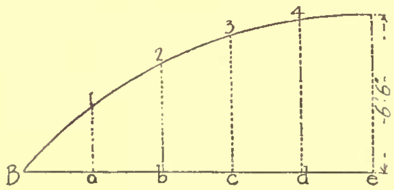
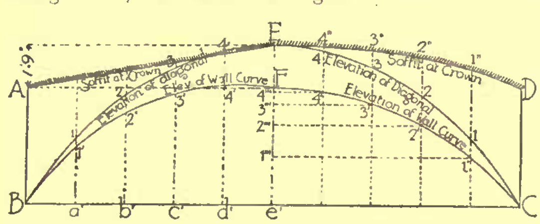


Fig. I.

Draw a section through centre of vaults, as shown in Figure 3, as follows: *B C* equals 20 feet; *E e′* equals 6 feet 6 inches. Draw the elevation of the diagonal line, by making the lines *a′* 1, *b′* 2, *c′* 3, etc., of the same length as the corresponding lines in Figure 2. If the crown of wall arch is 1 foot 3 inches below soffit of ribs, it will be 1 foot 9 inches below the curve of intersection, assuming the depth of rib, 6 inches; then *A*, Figure 3, will be 1 foot 9 inches lower than the point *E*, and as the soffit of vault is to be a straight line, the line *A E* will give the line of soffit of side vault, at crown.


Fig. 2.

Find the elevation of wall curve as follows: A point in the wall curve opposite *d*, Figure 1, will be as much lower than the point 4, Figure 3, as the line *A E*, Figure 3, pitches in the distance *A d′*, Figure 1. This distance is the space between the lines *A E* and *A F*, Figure 3, on the line *d′* 4. Laying off this space from the point 4, on line *d′* 4, gives the point 4′, which must be a point in the wall curve. The points 1′, 2′, 3′, Figure 3, are found in the same way. This gives the true elevation of the wall curve that will meet the requirements of the problem, and of course it is the only curve that will do so. To be sure that this solution is right, I have constructed a model which proves it. Such a vault could probably not be built of masonry, as there is nothing to resist the thrust at the crown.


Fig. 3.

Problem 2. — Assuming the curve of the diagonals to be a segment of a circle, what curve will give a proper line for the vaults, and what will be the nature of the soffit, the difference in height between crown of diagonal and wall arch being 1 foot 9 inches? The solution of this problem is shown in the right side of Figure 3. The curve, *C* 1 2 3 4 *E*, is the elevation of the diagonal, being, of course, the same as in Problem 1. Judging from the wall curve found in Problem 1, it appears that a circular curve, passing through *F* and *C*, will be the best form for the soffit of the side vaults. Assuming this curve, we must now find the line which would be given by a vertical section passing through the crown of the side vault, on the line *E D*. If the vault is a true vault, then the point *d′* in the crown (Fig. 1) must be as much above *d*, as the point *F*, Figure 3, is above 4′. The height of the point *d*, Figure 1, is the point 4, Figure 3, and laying off 4 4″ (Fig. 3), equal to *F* 4‴, we have the point 4″, which gives the elevation of the point *d′*. In the same way we obtain 3″, which is the elevation of the point *c′*, and so on for all the points desired.

This shows that we may assume the curve of the diagonal and of the wall arch, but the soffit will be something like the surface of a sphere. Problem 1 shows that if we assume the diagonal curve and the soffit, we may obtain a wall arch which may not be stable, and whose appearance might not be desirable.

I would recommend that your correspondent build his vault as shown in the right side of Figure 3; it will then be stable, look well, and answer his requirements, I think. Hoping this will prove a satisfactory answer, I remain, Yours truly, F. E. Kidder.

VANDALISM, EXCUSABLE OR INEXCUSABLE?

Boston, April 10, 1885.

To the Editors of the American Architect: —

Dear Sirs,—To certain criticisms on the general scheme of the Back Bay Park, of this city, printed in your paper some five years ago, at the commencement of the work, Mr. Olmsted was kind enough to reply, meeting the objections then urged against his design, so far as he could meet them, and giving his views as to the probable effect of the measures he proposed to carry out.

I am encouraged by this courtesy on the part of Mr. Olmsted, to ask him to repeat it, by explaining to a wondering public the reason for the wholesale destruction of fruit trees on the lands of the West Roxbury Park.

Anybody who is at all familiar with this region, will remember it as made up in great part of half a dozen old farms, on which were large numbers of apple trees, and a good many cherry and pear trees. Most of these were of large size, and although doubtless not in the best condition, regarded from the fruit-grower's point of view, were strong and vigorous, and could be depended upon for doing their full duty in blossoming time, to say nothing of the crop of fruit which followed.

Well, these trees, some hundreds in number, have now been all cut down. They lie in rows and in clumps, on every field; a melancholy spectacle. I may not be absolutely correct, but I am sure I can not be far wrong, when I say that over the whole five hundred acres or so there is not an apple tree or a cherry tree or a pear tree left standing, with the exception of a few around the house at the corner of Walnut avenue and one of the cross streets, now occupied by the Park Department. Mr. Olmsted has abolished apple blossoms forever over the whole stricken region.

"De par le roi, défense a Dieu
De faire miracle en ce lieu."

Such a piece of work as this has of course not been done without some deliberation, and there must have been a strong reason for it in the mind of the landscape-gardener. What was the reason? We have heard it attributed, at a venture, to a tender regard for the bowels of the small boy who is expected to disport himself in these fields during the season of green apples; and again, to a proper disgust for his rougher relations who, a little later, may break a bough or two in their haste to enjoy the riper fruit. It may have sprung from a fine professional disesteem for so common and vulgar a poor relation as these native growths of the home soil. Be the reason what it may, a good many persons, whose objurgations at what seems to them a wanton outrage are both louder and deeper than Mr. Olmsted would perhaps suspect, would be glad to know it, and to know at the same time what attraction that gentleman proposes to substitute for the glory of a New England apple orchard in May.

C.

NOTES AND CLIPPINGS.

German Architectural Diplomats. — It is said that the addition of the architectural attachés to the German embassies in different countries has met with marked success. Their reports to their Governments are of great value to the Minister of Public Works, and are read with great interest generally.

The Old Hollis Street Spire. — Workmen began yesterday taking down the spire of the old Hollis Street Church. The vane measured 7 feet 1 inch from tip to tip, the globe was 6 feet 6 inches in circumference, and the letters were 12 inches square. The height by actual measurement from the sidewalk to the under side of the globe was 183 feet 4 inches, and from the sidewalk to the top of the lightning rod was 203 feet 7 inches. The guesses on the measurement of the vane ranged from 2 to 40 feet, and on the height of the entire spire from 102 to 410 feet. Mr. Brigham has presented the vane, cardinal points and globe to the Bostonian Society at the Old State House, and has given one of the larger pews and four of the pillars of the spire to Major Ben. Perley Poore. — *Boston Journal.*

The Bull Rock Lighthouse.—About twenty miles west of Castletown Berehaven, Ireland, lately selected as a station for the British Navy, lies the Calf Rock, and three miles to the northwest is situated the Bull, where the Government are at present erecting a lighthouse to replace that of the Calf Rock, which was swept away in the great storm three years ago. A steamer belonging to the Board of Lights conveys the workmen from Castletown to the Bull Rock, but so dangerous is the approach, in consequence of the swift currents which prevail here, and which make the rock, even in the calmest weather, a very Scylla to modern navigators, that ordinary visitors are forbidden by a Board order from essaying the dangerous passage. By driving from Castletown to Dursey Sound, a journey of about fifteen miles, one may get a good idea of the boon the light will prove to storm-tossed mariners, by observing the inhospitable nature of the coast of which it is to serve as a beacon. The coast presents to the seaside a precipitous rocky wall, worn into strange shapes by the action of wind and wave, and broken occasionally by deep, narrow gorges or bays, studded with rock islands. Three rocks, the Bull, Cow, and Calf, lie off Dursey Head, the Bull situated at a distance of three miles to the northwest. The rock rises more than three hundred feet above the sea, and is pierced through from side to side by an immense natural cavern. This year will be wholly occupied in constructing steps and cutting barracks in the solid rock to house the workmen. Next year a chamber will be excavated in the summit, from which the top of the lantern will rise above the rock, so that the light will send out its beams from a height of more than three hundred feet above the surface of the sea. — *Iron Age.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents herementioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

314,750. SHUTTER-BOWER. — Michael R. Tallman, Philadelphia, Pa.

314,778. LOCK. — John H. Barnes and Joseph H. Woolaston, New Haven, Conn.

314,781. VAULT-COVER. — William H. Beckwith, Pittsburgh, Pa.

314,782. SASH-FASTENER. — David E. Bedell, Newark, N. J.

314,799. SASH-CORD FASTENER. — Wellington H. Christ, Pine Grove, Pa.

314,828. SECURING SHANKS TO GLASS KNOBS. — John W. Haines, Cambridge, Mass.

314,855. WEATHER-STRIP. — John H. Lamoureux, Robinson, Ill.

314,882. VENTILATOR. — Alfred S. Seaman, Frackville, Pa.

314,884. DRY-CLOSET, ETC.—Isaac D. Smead, Toledo, O.

314,899. FIRE-ESCAPE LADDER. — Robert M. Wilson, New York, N. Y.

314,918. SASH-FASTENER. — Benj. S. Curry, Manatee, Fla.

314,943. COCK FOR WASH-BASINS. — Joseph Jungbluth, Erie, Pa.

314,945. HEATING-APPARATUS. — Ernst Kerting, Hanover, Prussia, Germany.

314,974. SASH-FASTENER.—Robert S. Noble, West Bay City, Mich.

315,000. RATCHET MECHANISM FOR BIT-BRACES, SCREW-DRIVERS, ETC. — William R. Clarkson, Buffalo, N. Y.

315,014. BENCH-PLANE. — James Duncan, Coshocton, O.

315,016. TILE-MAKING ATTACHMENT FOR BRICK-MACHINES.—J. B. Foster, Zurich, Ontario, Can.

315,025. FIRE-ESCAPE. — George M. Heath, Rockingham, Vt.

315,040. HOT-AIR FURNACE. —Otis Jones, Chicago, Ill.

315,061. SHINGLE. — Willis J. Perkins, Grand Rapids, Mich.

315,063. MECHANISM FOR FLUSHING TANKS.—Geo. C. Phillips, Providence, R. I.

315,083. SELF-CLOSING HATCHWAY. — Richard D. Thackston, St. Louis, Mo.

315,111. DOOR OR SHUTTER. — Emerson Belden, Green Island, N. Y.

315,124. STAPLE.—William Chisholm, Cleveland, O.

315,137. SCREW-DRIVER. – Zachary T. Furbish and Franklin L. Hamlen, Augusta, Me.

315,138-140. BURGLAR-ALARM. —Alexander C. Gibson, Chicago, Ill.

315,152. BURGLAR-ALARM.—Ira G. Leek, San Francisco, Cal.

315,166. ELEVATOR. —Edward B. Powell, Portland, Mich.

315,200. MANUFACTURE OF BRICK. — Nathaniel S. Willet, Newark, N. J.

315,205. LATCH-LOCK. — Harlan P. Young, Lowell, Mass.

315,221. DOOR-CHECK AND HOLDER. — Thomas E. Barrow and Henry Wade, Mansfield, O.

315,264. COMBINED LEVEL, SQUARE AND BEVEL. —Matthew Euinton, West Upton, Mass.

315,284. DOOR-CHECK. — Charles E. Hewitt, Brandon, Vt.

315,294. SASH-FASTENER. — Edwin A. Johnson, Allegheny City, Pa.

315,302. DOOR-SPRING. — Salem T. Lamb, New Albany, Ind.

315,307. LOCK. — Washington I. Ludlow, Cleveland, Ohio.

315,313. ANNUNCIATOR. — James E. McDuff and John F. Doherty, Providence, R. I.

315,342. BASIN-ATTACHMENT FOR BATH-TUBS. — John Robinson and William J. Robinson, Philadelphia, Pa.

315,345. HEARTH GUARD OR SHIELD.—William J. Sanders, Gilmer, Tex.

315,347. SASH-PULLEY.—John B. Schroder, Cincinnati, O.

315,358. BRICK AND TILE MACHINE.—William W. Wallace, Frankfort, Ind.

315,365. WINDOW-FRAME. — Henry E. Willer, Milwaukee, Wis.

315,367. FIREPLACE. — Isaac C. Williams, Auburn, W. Va.

315,372-374. SAW. — Emanuel Andrews, Williamsport, Pa.

315,393. SHUTTER-WORKER. — Russell G. Dudley, Jersey City, N. J.

315,412. ILLUMINATING TILING AND GRATING FOR COVERING VAULTS, ROOFS, ETC. — Thaddeus Hyatt, Brooklyn, N. Y.

315,422. HEATING DEVICE.—George L. Lavery, Boston, Mass.

315,439. COMBINED BURGLAR-ALARM, MATCH-SAFE AND SASH-FASTENER.—Darius T. Phillips, Chicago, Ill.

SUMMARY OF THE WEEK.

Baltimore.

STABLE. — George Archer, architect, is preparing drawings for Messrs. Denny & Mitchell, for a three-st'y stable, 100′ x 120′, with tower 14′ square and 80′ high, to be erected cor. North Avenue and Oak St., to be of brick, with marble and terra-cotta finish, and to cost about $25,000; John Waters, builder.

BUILDING PERMITS. — Since our last report forty-nine permits have been granted, the more important of which are the following: —

M. Z. Hammen, 23 two-st'y brick buildings, s s Bowham St., between Wooster and Stockholm Sts.

Atto Goldbach, 7 two-st'y brick buildings, w s Chapel St., commencing n w cor. Jefferson St.

Mary Gerrens, three-st'y brick building, s s Chase St., between Valley and Hillman Sts.

Fannie Carrear, three-st'y brick building, s s Chase St., w of Valley St.

Charles E. Harker, 2 two-st'y brick buildings (square), e s Ensor St., between Chase and Biddle Sts.

J. W. Gerken, 2 two-st'y brick buildings, n s Boyd St., between Schroeder and Amity Sts.

Geo. Klein, 3 two-st'y brick buildings, w s Ropewalk Alley, between Heath and Barney Sts.

Wm. Klein, 2 two-st'y brick buildings, w s Ropewalk Alley, between Heath and Barney Sts.

L. German, 2 three-st'y brick buildings, commencing n w cor. Edmondson Ave. and Carlton St.

P. Heavy and others, 2 three-st'y brick buildings, commencing s w cor. Hanover and Clement Sts.

Wm. Reisinger & Son, three-st'y brick warehouse, and two-st'y brick stable, s s Portland St., between Greene and Emory Sts.

Chas. Michelman, 8 two-st'y brick buildings, e s Burke St., s of Aliceanna St.

F. D. Sauerwein, 8 three-st'y brick buildings, n s Lanvale St., commencing n e cor. Calhoun St.

John J. Purcell, 2 three-st'y brick buildings, n s Patterson Ave., between Stricker St. and Parrish Alley.

Geo. S. Brown, 14 two-st'y and mansard brick buildings, e s Fulton Ave., commencing s e cor. Harlem Ave.; 13 two-st'y brick buildings, w s Bruce Alley, s of Harlem Ave.; and 3 two-st'y and mansard brick building, s s Harlem Ave., commencing s w cor. Bruce Alley.

Chas. H. Callis, 14 two-st'y brick buildings, n s Preston St., e of Broadway.

M. Fallen, three-st'y brick building, s s Chase St., w of Hillman St.

Timothy Sullivan, three-st'y brick building, s w cor. Chase and Hillman Sts.

J. F. Weissner, three-st'y brick building, w s Belair Ave., between Federal and Boyd Sts.

G. Kaeisel, three-st'y brick building, e s Gay St., between Forest and Aisquith Sts.

Geo. C. Herschman, 10 three-st'y brick buildings, n s Biddle St., commencing n w cor. Ensor St.

Charlotte Lippe, 2 three-st'y brick buildings, George Alley, between Pennsylvania Ave. and Biddle St.

Boston.

BUILDING PERMITS.—*Brick.* — *Tremont St., Nos.* 1285 *and* 1287, cor. Prentiss St., apartment-house, 38′ and 39′ 4″ x 80′; John Miller, owner; J. E. Potter, builder.

Berkeley St., Nos. 92, 94 *and* 96, apartment-house, 23′ 6″ x 48′; Mary Knowlton, owner; Alvin Knowlton, builder.

Wood. — *Tremont St.*, near Newton Line, dwell. and restaurant, 26′ and 3[illegible]′ x 31′; J. F. Walsh, owner; Michael Ryan, builder.

Surrey St., near Foster St., poultry-house, 14′ x 25′; Chas. A. Wheeler, owner.

Harrison St., near Green Hill St., 2 dwells., 17′ and 25′ x 35′ 6″; A. W. Wright, owner; C. E. Currier, builder.

Harrison St., near Green Hill St., 2 dwells., 17′ and 25′ x 35′ 6″; C. E. Currier, owner and builder.

Dorchester Ave., No. 30, office, 18′ x 22′; H. S. Jordan & Co., owner; William McLean, builder.

East Fifth St., No. 590, dwell., 23′ x 42′; J. R. Duce, owner; W. T. Eaton, builder.

Bremen St., near Porter St., dwell., 22′ x 39′; L. F. Lambert, owner; R. H. Sproule, builder.

Border St., No. 244, stable and storage, 20′ x 35′; P. M. Gifford, owner and builder.

East Third St., near H St., dwell. and store, 19′ x 30′; James V. Devine, owner and builder.

H St., cor. Emerson St., dwell., 17′ and 24′ x 33′; owner and builder, same as last.

East Third St., cor. Emerson St., dwell., 21′ 4″ x 33′; owner and builder, same as last.

H St., cor. East Third St., dwell., 21′ 4″ x 33′; owner and builder, same as last.

Emerson St., near H St., 2 dwells., 18′ and 20′ x 33′; owner and builder, same as last.

East Third St., near H St., dwell., 17′ x 30′; owner and builder, same as last.

Dudley St., cor. Dudley Pl., dwell., 23′ x 52′; F. W. Kittredge, owner; James Portune, builder.

Dudley St., near Blue Hill Ave., dwell., 23′ x 52′; owner and builder, same as last.

Dudley St., near Blue Hill Ave., dwell., 20′ x 52′; Mabel Wheaton, owner; Jas. Portune, builder.

Dudley St., opposite Magazine St., dwell., 20′ x 52′; owner and builder, same as last.

Mechanic St., off Brighton Ave., 2 dwells., 19′ x 28′; Edmund Dole, owner; Christopher Keake, builder.

Phillips St., near Conant St., 2 dwells., 22′ x 35′; L. S. Conant, owner; W. T. Eaton, builder.

Dudley St., near Blue Hill Ave., dwell., 20′ x 52′; Mabel Wheaton, owner; James Portune, builder.

Dorchester Ave., near Greenwich St., dwell. and store, 23′ x 32′; James O'Neil, owner; James Portune, builder.

Brooklyn.

BUILDING PERMITS. — *Humboldt St., No.* 259, w s, 75′ n Ten Eyck St., three-st'y brick tenement, tin roof; cost, $7,000; owner and architect, John McQuade.

St. John's Pl., s s, 235′ w Seventh Ave., 4 three-st'y brick dwells., tin roofs; cost, each, $9,000; owner and architect, Thomas F. Green, 195 Sixth Ave.

Halsey St., s s, 140′ e Reid Ave., two-st'y brick dwell., tin roof; cost, $4,500; owner, James Herring, 632 Halsey St.; architect, M. Walsh.

Willoughby Ave., n s, 46′ w Hall St., 4 five-st'y brick dwells., tin roofs; cost, each, $3,500; owner, Henry C. Coe, 535 Washington Ave.; architect, A. Hill.

Putnam Ave., s s, 295′ w Tompkins Ave., 3 three-st'y brown-stone dwells., tin roofs, wooden cornices; cost, each, $9,000; owner and builder, H. A. Weed, 243 Putnam Ave.; architect, I. D. Reynolds.

South Fourth St., n s, 25′ w Twelfth St., three-st'y brick tenement, tin roof; cost, $6,500; owner, Mrs. Turner, South Fifth St., near Division Ave.; architect, J. Platte; builder, S. J. Burrows.

Madison St., n s, 80′ e Bedford Ave., three-st'y brick dwell., tin roof; cost, $6,000; owner, John S. or John B. Grube, 133 Madison St.; architect, A. Hill.

Monroe St., s s, 235′ e Throop Ave., 2 two-st'y brown-stone dwells.; cost, each, $4,000; owner, architect and builder, W. J. C. Miller, 299 Sumner Ave.

Lincoln Pl., s s, 150′ w Seventh Ave., 3 three-st'y brown-stone dwells., tin roofs; cost, each, $10,000; owner and mason, John Monas, 92 Park Pl.; architect and contractor, J. J. Gilligan.

Locust St., s s, 175′ e Broadway, 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,000; owner, Chas. Goetz, Park Ave., cor. Throop Ave.; architect, G. Hillenbrand; builder, D. Kreuder.

Lafayette Ave., n s, 119′ 6″ w Bushwick Ave., 3 two-st'y frame dwells. (brick-filled), tin roof; cost, each, $3,500; owner, Anna A. Fardon, 1132 Lafayette Ave.; builder, A. A. Fardon.

Lafayette Ave., n s, 87′ 6″ w Bushwick Ave., two-st'y frame dwell., tin roof; cost, $3,500; owner and builder, same as last.

Foot of North Tenth St., 250′ w First St., two-st'y brick cooperage-building, gravel roof; cost, $12,000; owner, Pratt M'f'g Co., on premises; architect, J. A. Moffett; builder, not selected.

Van Dyke St., n s, 150′ w Richard St., three-st'y brick dwell., tin roof; cost, $6,200; owner, A. H. Gutkes, 72 Delevan St.; architect, F. E. Lockwood; builders, P. Kelly & Sons.

Sixth Ave., s w cor. Nineteenth St., three-st'y frame store and dwell., tin roof; cost, $4,000; owner, Henry Schmidt, cor. Eighteenth St. and Sixth Ave.; architect, D. E. Harris; builders, E. P. Crane and D. E. Harris.

Oakland St., n w cor. Kent St., three-st'y frame (brick-filled) store and tenement, gravel roof; cost, $4,800; owner, James E. Martin, on premises; architect, F. Weber; builders, Port & Walker.

Jackson St., n s, 50′ w Humboldt St., three-st'y frame (brick-filled) tenement, tin roof; cost, $6,000; owner, H. G. D. Rohlfs, 183 Jackson St.; architect, John Platte; builders, Jacob Rauth and Jacob Bossert.

Broadway, n e cor. Palmetto St., 5 three-st'y brown-stone stores and flats, tin roofs; cost, each, $8,000; owners and builders, Cozzens & Barton, 173 Stuyvesant Ave.; architect, I. D. Reynolds.

Putnam Ave., n s, 435′ e Tompkins Ave., 3 three-st'y brown-stone dwells., tin roofs, wooden cornices; cost, each, $9,000; owner, John F. Saddington, 462 Willoughby Ave.; architect, F. D. Vrooman.

Taylor St., n s, 46′ w Kent Ave., two-st'y brick stable, gravel roof; cost, $3,000; owner, T. F. Taylor, foot of Wilson St.; architect and builder, J. H. Devoe.

Smith St., w s, about 60′ n Ninth St., 3 three-st'y brick tenements, gravel roofs; cost, each, $3,000; J. G. L. Boettcher, 101 Dean St.; architects, Parfitt Bros.; builders, Kolle & Starbler.

Putnam Ave., n s, 395′ e Tompkins Ave., 2 two-st'y brown-stone dwells., tin roofs, wooden cornices; cost, each, $7,000; owner, John F. Saddington, 462 Willoughby Ave.; architect, F. D. Vrooman.

Hoyt St., w s, 30′ s Sackett St., 4 two-st'y brown-stone dwells., felt and gravel roofs; cost, each, $3,200; owner, E. Pearson, 24 First St.; architect and builder, Theo. Pearson.

Jefferson St., n s, 24′ w Tompkins Ave., 9 three-st'y brown-stone dwells., tin roofs; cost, each, $6,500; owners, etc., Colson & Reiner, 122 Tompkins Ave.

Wythe Ave., Nos. 98 *and* 100, w s, 2 four-st'y brick stores and tenements, tin roofs; cost, each, $9,000; owner, F. Thill, cor. Taylor St. and Kent Ave.; architect and builder, J. H. Devoe.

Gates Ave., s s, 225′ e Nostrand Ave., four-st'y Trenton brick store and flats, gravel roofs; cost, $8,500; owner, Mary Moore, 410 Gates Ave.; architect, Amzi Hill; builder, Paul C. Grening.

First St., s s, 100′ w Sixth Ave., 10 two-st'y brown-stone dwells., tin roofs; cost, each, $4,500; owners and contractors, Conway & Moubray, s w cor. First St. and Sixth Ave.; mason, not selected.

Union St., s e cor. Seventh Ave., and *President St.*, n e cor. Seventh Ave., 8 three-st'y brown-stone dwells., metal roofs; cost, each, $10,000; owner, architect and builder, Wm. Flanagan, 46 Berkeley Pl.

ALTERATIONS. — *Fourth Ave.*, n w cor. Wyckoff St., three-st'y brick extension, tin roof; cost, $4,400; owner, Henry Cooper, Bowery, cor. Houston St., architect, B. W. Warner; builders, M. Ryan and B. C. Condit.

Chicago.

BUILDING PERMITS.—C. W. Faulkner, two-st'y dwell., 318 North State St.; cost, $5,000; architect, W. L. Beers.

J. Blain, two-st'y dwell., 809 Clybourn Ave.; cost, $3,500; builder, W. H. Hellman.

G. Nocquet, two-st'y dwell., 22 Elkgrove St.; cost, $3,000; builder, N. Rathgen.

J. Lathau, three-st'y dwell., 132 Hudson Ave.; cost, $6,000.

Wm. Kroeschel, two-st'y dwell., 457 Dayton St.; cost, $5,000.

Mrs. S. Gannon, two-st'y dwell., 685 Superior St.; cost, $2,600.

J. Shannon, two-st'y store and dwell., 3529 Wentworth Ave.; cost, $2,500.

C. Seeger, three-st'y store and flats, 137 Hurlbut St.; cost, $6,000; architect, H. Guoer; builder, A. Kuerker.

Wm. Frampeim, cottage, 324 Twenty-fourth St.; cost, $4,300.

S. Meilon, two-st'y store and dwell., 644 Centre Ave.; cost, $3,000; builder, A. Wendt.

C. E. Mantz, three-st'y dwell., 53 Belleview Pl.; cost, $7,000; architects, Frommon & Gebson.

C. Schauss, three-st'y store and flats, 930 Halsted St.; cost, $5,000; architect, C. F. Berlin.

S. Vankirk, 2 two-st'y dwells., 429 Idaho St.; cost, $4,600.

Geo. Ross, two-st'y dwell., 539 Jackson St.; cost, $3,000.

A. G. Merriman, two-st'y dwell., 541 West Jackson St.; cost, $4,000.

F. N. Mills, 3 two-st'y dwells., 3116-3120 Vernon Ave.; cost, $10,000.

J. Monahan, three-st'y store and dwell., 106 Elizabeth St.; cost, $5,000; builders, McMillan Bros.

C. Mages, cottage, 729 Hoyne Ave.; cost, $2,800.

J. Stash, two-st'y dwell., 458 Noble St.; cost, $3,500; builders, Wenz & Bishop.

J. Hilbert, two-st'y dwell., 948 North Halsted St.; cost, $3,000; builder, G. Wolf.

G. Brayton, three-st'y stores, 3518 and 3520 Vincennes Ave.; cost, $2,500.

J. Krauter, two-st'y store and dwell., Milwaukee Ave.; cost, $4,500; architect, Kley.

J. Fenderclout, two-st'y dwell., 476 West Congress St.; cost, $8,000; architect, J. Warner; builder, J. Bagley.

J. H. Burke, two-st'y dwell., 191 West Congress St.; cost, $2,800.

Wm. Brown, two-st'y dwell., 1031 Wilcox Ave.; cost, $4,000; builder, D. Wilkie.

J. Stepalek, two-st'y store and dwell., 623 Centre Ave.; cost, $3,500; builders, Waska & Sons.

A. Vaughan, two-st'y dwell., 678 Washington St.; cost, $7,000; architect, J. H. Moore.

V. Smerz, three-st'y dwell., 828 Allport Ave.; cost, $4,000.

F. E. Kreussler, three-st'y rear addition, 2168 Archer Ave.; cost, $3,000.

E. W. Egeress, three-st'y store and dwell., 209 North Ashland Ave.; cost, $3,000; architects, Lund & Gilbert.

W. Woelker, two-st'y dwell., 514 West Chicago Ave.; cost, $3,000; architect, F. Hagerman.

Mrs. Mary Scudder, two-st'y dwell., 63 Belleview Pl.; cost, $10,000; architects, Cobb & Frost.

J. Thompson, 4 cottages, North Leavitte St.; cost, $5,000.

G. Foreman, two-st'y dwell., Michigan Ave.; cost, $25 000; architect, L. B. Dixon.

Denver, Col.

Building Permits. — E. F. Hallack, three-st'y brick business house, 42' x 100', Nineteenth St.; cost, $12,000.

Wm. Scott Lee, dwell., 29' x 60', Grant Ave.; Varian & Sterner, architects; cost, $7,000.

Donald Fletcher, two-st'y brick business house, Sixteenth St.; cost $6,000; Fred A. Hale architect.

Mrs. E. B. Howland, dwell., 29' x 48'; Clarkson St.; Wm. Quayle, architect; cost, $3,700.

A. A. Higgenbotham, dwell., 25' x 56'; Pearl St.; Wm. Quayle, architect; cost, $4,500.

P. P. Wilcox, two-st'y brick business house, 50' x 100'; Curtis St.; cost, $15,000.

B. M. & A. S. Hughes, two-st'y brick business house; Edbrooke & Co., architects; Sixteenth St.; cost, $15,000.

E. B. McCrary, two-st'y brick dwell.; Evans St.; Edbrooke & Co., architects; cost, $6,000.

Mrs. S. H. Moore and Mrs. Alfred Wolff, two-st'y brick dwell., South Fourteenth St.; Fred A. Hale, architect; cost, $7,000.

New York.

Flats. — On the south side of Ninety-second St., commencing 132' w of Madison Ave., a five-st'y brown-stone flat, 25' 6" x 100' 8", is to be built for John Livingston, from plans of Mr. F. T. Camp.

For Thomas Smith, a five-st'y brick and brown-stone flat and store, 25' x 96', is to be erected on the n e cor. of One Hundred and Fifteenth St. and Lexington Ave., from plans of Messrs. Babcock & McAvoy; cost, $20,000.

Houses. — Five three-st'y and basement brown-stone houses are to be built for Mr. V. D. Genovese, on the n s of Eighty-second St., 200' w of Ninth Ave., from plans of Mr. E. Gandolfo.

On the n s of Eighty-second St., 100' e of Ninth Ave., 4 four-st'y and basement high-stoop dwells. are to be erected by Richard Deeves.

Store. — On the n s of White St., between Church St. and West Broadway, a six-st'y iron-front store, to cost $25,000, is to be erected, from plans of Messrs. Cleverdon & Putzel.

Building Permits. — *West Thirtieth St., No.* 213, three st'y and basement stone and brick dwell., slate and tin roof; cost, $20,000; owners, Nuns of St. Dominick, Sister M. Seraphina Stramer, Superioress, Brooklyn; architect, Wm. Schickel.

West Thirty-fifth St., No. 238, five-st'y brick tenement, tin roof; cost, $11,000; owner, Leonard Gattman, 326 East Fifty-second St.; architects, Schwarzman & Buchman; builder, John F. Moore.

Seventy-third St., s s, 100' e Madison Ave., 10 four-st'y brown-stone front dwells., tin roofs; cost, three, each $22,000; five, each $20,000; and two, each $18,000; owner, architect and builder, R. W. Buckley, 810 Fourth Ave.

One Hundred and Eighth St., n s, 100' w Third Ave., four-st'y brick workshop, tin roof; cost, $8,000; owner, Michael Fallibee, 149 East Fifty-third St.; architect, John Sexton.

Second Ave., No. 2108, five-st'y brown-stone front tenement, tin roof; cost, $20,000; owner, Adam Harrmann, on premises; architect, Wm. Fernschild.

Second Ave., s e cor. Eighty-fourth St., 2 five-st'y brick tenements and stores, tin roof; cost, $18,500 and $22,000; owner, Eva Muller, 416 East Seventy-sixth St.; architect, John Brandt.

Eighty-fourth St., s s, 300' w First Ave., 4 five-st'y brown-stone front tenements, tin roofs; cost, each, $16,500; owner and architect, same as last.

Eighty-fourth St., n s, 100' e Second Ave., 2 five-st'y brown-stone front tenements and stores, tin roofs; cost, each, $18,000; owner and architect, same as last.

Eleventh Ave., s e cor. Seventy-fifth St., 6 three-st'y brown-stone front dwells., slate and tin roofs; owners and architects, Lamb & Rich, 265 Broadway; builders, Alex. Brown, Jr., and John J. Brown.

Eighty-fourth St., n w cor. Boulevard, 10 three-st'y brick dwells., tin and slate roofs; owner, George W. Rogers, 104 East One Hundred and Twenty-fourth St.; architects, Cleverdon & Putzel.

Eighth Ave., s w cor. One Hundred and Sixteenth St., 2 five-st'y brick flats and stores, tin roofs; cost, each, $17,000; owner, James Connor, 172 East One Hundred and Twelfth St.; architect, G. Robinson, Jr.

Eighth Ave., w s, 40' s One Hundred and Sixteenth St., 2 four-st'y brick flats and stores, tin roofs; cost, each, $22,000; owner and architect, same as last.

One Hundred and Thirty-first St., s s, 225' w Sixth Ave., 4 three-st'y and basement brick dwells., tin roofs; cost, $12,000; owner, Samuel O. Wright, 103 West Thirtieth St.; architects, Cleverdon & Putzel.

St. James St., Fordham, two-st'y frame dwell., shingle roof; cost, $4,000; owner, John B. Haskin, Fordham; builders, C. V. Folin & Son.

One Hundred and Forty-eighth St., s s cor. Willis Ave., three-st'y frame tenement, tin roof; cost, $7,500; owner, Anton Loeffler, 134 North Third Ave.; architect, Adolph Pfeiffer; builder, not selected.

Broadway, n e cor. Thirty-third St., eight st'y brick store, bachelors' apartments, and studios; cost, $220,000; owner, David H. McAlpin, 673 Fifth Ave.; architects, D. & J. Jardine.

COMPETITIONS.

CITY-HALL.

[At Richmond, Va.]
February 16, 1885.

Proposals are invited **until June 1st, 1885**, for furnishing designs for a city-hall upon which premiums will be paid as follows: —

For first best design, $700.

For second best design, $300.

The Committee on Grounds and Buildings of the City Council reserves the right to reject any and all designs.

For information address the undersigned.

487 W. E. CUTSHAW, City Engineer.

PROPOSALS.

WROUGHT AND CAST IRON WORK.

[At Washington, D. C.]

Engineer's Office, Washington Monument, Washington, D. C., April 13, 1885.

Sealed proposals for furnishing and delivering wrought and cast iron work, etc., required in the interior of the Washington Monument, in this city, will be received at this office **until 12 M., on the 30th day of April, 1885**, and opened immediately thereafter in the presence of bidders.

Specifications, blanks, drawings, and any further information can be obtained at this office.

THOS. LINCOLN CASEY,
Colonel Corps of Engineers,
487 Engineer-in-Charge.

LEVEE.

[At Jeffersonville, Ind.]

U. S. Engineer Office, Cincinnati, O., March 17, 1885.

Sealed proposals in duplicate will be received at this office **until noon** (local time) **on Thursday, the 30th day of April, 1885**, for constructing a levee at Jeffersonville, Ind.

Approximate quantity of earth, 43,400 cubic yards.

Specifications and printed forms for proposals will be furnished on application to O. A. Clark, C. E., at Jeffersonville, Ind., or to the undersigned.

WM. E. MERRILL,
487 Lieut.-Col. of Engineers.

WATER PIPE.

[At Nashville, Tenn.]
March 25, 1885.

Sealed proposals for furnishing and delivering, f. o. b. in Nashville about four thousand tons of thirty-six inch cast-iron water pipe, will be received at this office **until 4 P. M., April 27th.** Each proposal must be accompanied by a certified check for one thousand dollars as a guarantee that the successful bidder will enter into a contract within ten days from the date of notification of award. The right is reserved to reject any or all proposals, or to waive defects. *Specifications, Instructions to Bidders, Blank proposals and blank contract*, will be furnished on application.

By order of the Board of Public Works and Affairs,

OLIN H. LANDRETH,
486 Hydraulic Engineer.

HOSPITAL WARDS.

[At St. Peter, Minn.]
St. Peter, Minn., April 4, 1885.

Sealed proposals will be received by the undersigned, Secretary of the Board of Trustees, Minnesota Hospital for Insane, **until 12 M., May 6, 1885**, for building two detached wards to first Hospital for Insane, at St. Peter, Minn., according to plans and specifications which may be seen at the office of H. E. Horton, Architect, at Rochester, Minn., and at the hospital at St. Peter.

Each bid must give the name or names and P. O. address of all parties interested in or parties to it.

Each bid must be accompanied by a certified check on some National or State Bank of the State of Minnesota, for the sum of $500, payable to the order of William Schimmel, Treasurer, to be forfeited to the State of Minnesota by any bidder who, his bid being accepted, fails to enter at once into contract for the work, otherwise to be returned to bidder.

All stone for building (except dressed stone) will be furnished at the hospital quarry, near contemplated buildings; will also furnish 250 M brick and do the excavating for basements.

The accepted bidder must give the necessary bond, with good and sufficient sureties, to be approved by the Board of Trustees, conditional on the faithful performance of the contract, in the sum of one-third the amount of contract.

Bids should be addressed to the Trustees, and marked, "Proposals for building detached wards at St. Peter."

The buildings to be completed on or before August 1, 1886, no payments to be made before August 1, 1885, and not to exceed one-half the amount of the contract to be paid before January 1, 1886.

The Trustees reserve the right to reject any or all bids not satisfactory.

A. L. SACKETT,
488 Secretary of Board of Trustees.

PLUMBING.

[At David's Island, N. Y. Harbor.]

Depot Quartermaster's Office, David's Island, N. Y. Harbor, April 3, 1885.

Sealed proposals, in triplicate, subject to the usual conditions, will be received at this office **until 12 o'clock, noon, Monday, April 20, 1885**, at which time and place they will be opened in presence of bidders, for plumbing-work necessary to carry water from water-mains into buildings at David's Island, New York Harbor.

The Government reserves the right to reject any or all proposals.

Blanks and full information furnished on application.

GEO. H. COOK,
484 Capt. and Asst. Quartermaster.

HEATING AND VENTILATING APPARATUS.

[At Frankfort, Ky.]

Office of Supervising Architect, Treasury Department, Washington, D. C., April 11, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 11th day of May, 1885**, for furnishing and putting in place, complete, in the court-house, post-office, etc., building at Frankfort, Ky., a low-temperature hot-water heating-apparatus, in accordance with drawings and specification, copies of which and any additional information may be had on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check for $500.00, drawn to the order of the Secretary of the Treasury, as a guarantee that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered.

M. E. BELL,
487 Supervising Architect.

IRON, STONE, AND BRICK WORK OF APPROACHES.

[At Jackson, Miss.]

Office of Supervising Architect, Treasury Department, Washington, D. C., April 10, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 2d day of May, 1885**, for furnishing and setting in place the fence coping, gate and fence posts, street curb and brick pavement; also, furnish and fix in place all the iron fences, gates, pipe railings, gratings, etc., required for approaches to the court-house, post-office, etc., building at Jackson, Miss., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office or the office of the Superintendent.

Bids must be accompanied by a certified check for $300 for stone and brick work, and $300 for the iron-work, drawn to the order of the "Secretary of the Treasury," as a guaranty that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received *after* the time of opening will not be considered.

M. E. BELL,
487 Supervising Architect.

GRATES, MANTEL TILES, ETC.

[At Kansas City, Mo.]

Office of Supervising Architect, Treasury Department, Washington, D. C., April 14, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 5th day of May, 1885**, for supplying and setting in place complete, all the grates, mantel tiles, etc., required for the custom-house, etc., building at Kansas City, Mo., in accordance with the drawing, specification, and schedule, copies of which and any additional information may be had on application at this office or the office of the Superintendent.

Bids must be accompanied by a certified check for $100, drawn to the order of "The Secretary of the Treasury," as a guaranty that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered.

M. E. BELL,
486 Supervising Architect.

JAIL AND HOUSE OF CORRECTION.

[At Springfield, Mass.]

Office of the Commissioners of the County of Hampden, State of Massachusetts.

Sealed proposals for the erection and completion of a jail and house of correction for the County of Hampden, to be located on York Street, in the city of Springfield, Massachusetts, will be received by the undersigned, Commissioners of said County, at their office, **until Tuesday, May 12, 1885.**

Plans and specifications can be seen at the office of D. H. & A. B. Tower, Architects, at Holyoke, Mass., on and after Thursday, April 16, 1885.

The builders to whom the contract shall be awarded will be required to enter into bonds, with at least two approved sureties, for the sum of $35,000, for the faithful performance of the contract.

Bidders will be required to send certified check for the sum of $500 with proposals.

Work to be commenced within 20 days of awarding of contract, and to be finished on or before the 15th day of November, 1886.

The right reserved to the Commissioners to reject any or all bids.

LEONARD CLARK,
HENRY A. CHASE,
488 L. F. ROOT,
Commissioners of the County of Hampden.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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APRIL 25, 1885.

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THE most interesting event of the week to architects and builders seems to have been the arraignment of Buddensiek, the New York contractor, whose block of eight houses fell down the other day, on a charge of manslaughter. Fortunately, perhaps, for the public, one of the men injured in the catastrophe died a day or two afterward, and, as the prosecuting attorney said, this occurrence so "simplified matters," by enabling him to define the crime for which the builder was to be held to answer, that he only hesitated whether to complain of the culprit for simple manslaughter or for murder in the first degree, under that clause in the official definition of murder in the first degree which includes under it "the causing of death by an act imminently dangerous to others, and evincing a depraved mind, regardless of human life, although without a premeditated design to effect the death of any individual." In point of fact, this definition of murder very well describes the doings of Mr. Buddensiek for the past few years; but the attorney, probably concluding on reflection that he was hardly likely to get a conviction on a capital charge, decided to prosecute only for manslaughter in the second degree, so that the contractor will, for the present at least, escape being hung by the sheriff for his misdeeds, although, as the penalty for the crime of which he is now accused is fifteen years in the State prison, his mischievous activity will, if he is convicted, be checked for a while.

FROM the official records, which the zealous New York reporters have hunted up, it appears that Buddensiek has built, either in his own name, or in that of his clerks and teamsters, whom he puts forward to cover himself from official interference, more than fifteen hundred houses in New York within ten or twelve years. Most, if not all of them, have been of the common type of New York houses, with handsome cut-stone fronts and showy inside finish, and nearly all, with the exception of a dozen or more, which fell down before they were finished, have been sold at remunerative prices; but their construction has rendered them famous, from the time that Mr. Buddensiek first appeared as a builder in the city, for their bold and ingenious defiance of the laws of stability, permanence and health. Within the last five years alone one hundred and thirty-five official complaints have been entered upon the records of the Building Bureau against Mr. Buddensiek or his representatives, for all sorts of violations of the building law, and eighteen suits have at various times been brought against him, in his own name, by the Board of Health, for persistent neglect of its remonstrances and orders. A few years ago, he was arrested and tried for having put drains in the cellars of some of his houses with nothing in the joints, so that the filth ran out and saturated the cellar-floors, but, although it was proved that the occupants of the houses had had typhoid fever and diphtheria, and that one of them had died, he escaped punishment. So successful have his speculations been that it is suggested that an important influence in his favor in the present case will be exerted by the persons, probably at least ten thousand in number, who own or live in houses built by him, and will endeavor to hush up proceedings tending to discredit the property in which they are interested. Of late years, as it appears, he has employed his peculiar talent, together with his surplus earnings, in a field which of all others must be the most congenial to him, that of building seashore houses and hotels. Of the former he now owns a large village, at a new place near Long Branch, and of the latter he did own one at the same place, until it burned down last autumn, the guests escaping pell-mell in their night-clothes. His ingenuity in evading the law has been hardly less conspicuous than his genius for economical construction, and by putting the title to his land in the name of one fictitious or irresponsible person, and carrying on his operations upon it in the name of another of the same kind, he has been able to keep the agents of the Board of Health and the Building Bureau employed in long and fruitless searches after the individuals whom the law compels them to attack, while he continued unmolested the criminal acts for which every one knew him to be really, though not technically responsible.

AS a result, perhaps, of the impulse given to popular feeling by the Buddensiek case, the Daly Building Act, which has been pending before the Legislature in some form for nearly two years, passed the New York Senate, and will probably be pressed through the Assembly without delay. This law, which was drawn up by representatives of the real-estate owners and dealers, insurance managers, and builders, aided by the late Inspector of Buildings, who devoted himself most earnestly to the work, is a great advance upon the present statute, good as this is, and will, if passed, make building in New York both easier and better than it now is, modifying, as it does, some of the rather unreasonable, or at least, inelastic provisions of the present Act, and adding others, such as those for the protection of the public in theatres, and one requiring that all buildings more than seventy feet high shall be fire-proof throughout, which would alone, in course of time, make some of the worst calamities due to bad building impossible in New York.

A MYSTERIOUS affliction has fallen upon the occupants of the building known as the Soncy Flats, on West Fifty-seventh Street, in New York, in the shape of unaccountable explosions, which occur once or twice a day, and are violent enough to shake articles off the mantels, but seem to have no other unpleasant result, and cannot be explained on any ordinary theory. The explosions began a month ago or more, and were attributed to water in the heating pipes, but an examination of these showed nothing out of the way, and the noises gradually ceased, to recommence a few days ago, with as much violence as ever. The explosions are confined to the three upper stories, and are not heard in the basement, this circumstance going to show that they cannot be in the steam-pipes, as the metal of the pipes would certainly carry such a noise all over the building. A more probable source of the vibrations is, perhaps, to be sought in the blasting operations which have for some time been going on at a little distance, but the occupants of the rooms assert that there is no connection between the two phenomena. If we might hazard a guess at the cause of the noises, supposing that they do not proceed from the blasting, we should be inclined to lay them to the effect of contraction or expansion in some metal, perhaps in steam or water pipes, or possibly in the roofing. Every one who has listened to the sound of the nails in wooden houses contracting in very cold weather, and drawing out of the timber with a sharp noise, will understand the way in which an elastic substance like metal may, if held by any means, pull itself away with a sudden shock; and it is just possible that some pipe in the building may be so fixed in place that any variation in its length produces a strain, and subsequent sudden release, which shakes the surrounding parts of the structure.

A RATHER hollow ceremony took place the other day at a little town on Long Island, where a huge church, built with the money of a person so rich that the gift involved no sacrifice, in a place which is now principally known as the scene of a great, but unsuccessful land speculation, was dedicated to the service of the Christian religion. Unfortunately, the congregation which can now be collected in the town is a small one, while the church is not only very large, but is supplied with a thirty-horse-power steam-engine to assist in the music, an organ which cost a hundred thousand dollars, an "elegant mausoleum" which cost a hundred and fifty thousand

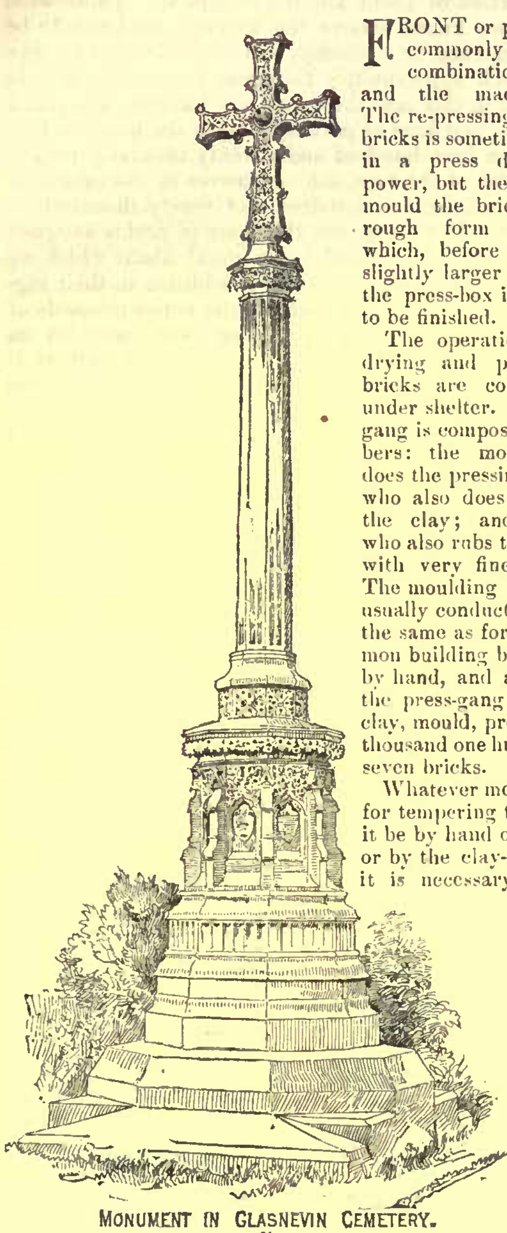
dollars, stained-glass windows from London which cost a great many more thousand dollars, and "rich marbles, fine wood-carvings and brass-work" without end, and as it would naturally be a waste to throw the enjoyment of all these expensive luxuries away on a few people, steps have been taken, as we are told, not only for running cheap excursion trains from New York and Brooklyn to the services, but for giving the church an ecclesiastical attraction by constituting it a cathedral for the diocese of Long Island. Fortunately, the diocese of Long Island is poor, and quite unable to maintain a cathedral, even if it were so injudicious as to want one ten or twelve miles from the place where most of the members of the church live, and as for the congregation, we should be sorry to think that even excursion trains would tempt a single member of the smallest and poorest Episcopal church in New York or Brooklyn to desert it for all the glories of the elegant mausoleum and the thirty-horse-power engine, and if the self-named cathedral should have to content itself, for many years, whether the excursion trains run or not, with being the scene of the devotions only of the villagers, and of a few staring strangers, we do not know that either the church or the public need to feel much regret.

IT is only a few days since some one made public complaint that New York had no flower-market, like those which render the neighborhood of Covent Garden in London, and the great Boulevards in Paris, so attractive during the greater part of the year. It is true that vast quantities of flowers are sold in New York, but the business is scattered among a great number of florists and itinerant venders, most of whom probably lose considerable sums by the fading of their perishable goods which might be saved if their resources could be better concentrated. In London, where the Covent Garden quotations for rosebuds and violets are reported as regularly as the prices of wheat in Mark Lane, there is little more to be done, but in Paris it has long been thought desirable that better facilities for the pretty traffic should be provided, and a concession was granted not long ago for erecting on the sidewalk beside the Madeleine a sort of portable market-shed which would be admirably adapted to the wants of New York. The shed, or rather shelter, is supported by iron posts, for which gas-pipes would serve very well, put in permanent iron sockets, set in the asphalt of the sidewalks, and fixed by means of a key. Two rows of posts run along the sidewalk, those in one row being a little longer than the others. Each post has a socket at the top, and in these are laid longitudinal and transverse pieces of wood, over which is spread an oiled canvas covering. The wooden rafters are held in the sockets by pins, and the cloth covering is secured in the simplest manner. Nothing more is needed but to set benches and tables for the flower-merchants, who can display their goods to the best advantage, out of reach of the hot sun; and the whole affair can be taken down and carried away in a few minutes, if necessary. There are many places in New York, such as Twenty-third Street, or Madison or Union Square, where there is room enough for a market of this kind which might easily be made one of the principal attractions of the city.

A REMARKABLE example of a successful attempt to interest workmen in the business which they help to carry on is to be found, according to *La Semaine des Constructeurs*, in a certain great paper manufactory, that of M. Laroche-Joubert, at Angoulême. In this establishment a system has for some years been pursued by which the operatives participate in the profits of the business in a manner depending somewhat on their skill as well as their industry. To give what is certainly a very reasonable advantage to the intelligence which every workman should be encouraged to cultivate, the operatives are divided into classes, according to the sort of work on which they are engaged, and a standard is established for each class, showing the proportions in which intelligence, manual exertion and the use of capital enter into the value of the articles produced by that class. At the end of the year the profit of the business for the year is ascertained, and the whole sum divided into three parts, one of which is assigned as the reward of intelligence, one of labor, and the third as the compensation for the use of capital. The share of each workman is then computed, according to the scale of the class to which he belongs, and is paid to him in cash. If any wish, they are allowed to return the money, to be invested in the business, receiving what we should call a certificate of stock in exchange, and of course secure, in addition to their other income, their share in the portion of profit allotted to capital. Those who, like many that we know, believe the average workman to be incapable of prudence or economy, and little disposed to take advantage of such opportunities to invest his savings, will do well to note that in this case the operatives have so far availed themselves of the privilege of participating in the business that out of one million four hundred and seventy thousand dollars, the present capital of the firm, the operatives in the establishment hold one million one hundred and ninety thousand, or nearly four-fifths. If we suppose the share of profits assigned to intelligence, labor and capital to be equal, about which we are not informed, the operatives thus, in addition to their regular wages, receive fourteen-fifteenths of the entire proceeds of the business; the principals of the house, who carry on its affairs, with the consent of the small stockholders, just as if they were the sole parties interested, contenting themselves with the remaining fifteenth. In some respects this is certainly the most promising example of a coöperative industry yet described. Without the somewhat artificial methods in use at Guise, the same result, of gradually admitting those employed in a great manufacturing establishment to ownership and final control, is attained. That this is better than the simple division of a portion of the profits among the men is evident. Such division of profits, without the assumption of a corresponding risk by the workmen, is generally felt both by employers and employed as a charity, often irksome to the former, and not particularly beneficial, as a mode of encouraging independence and character, to the latter; but the assumption by the operatives, as in the case of the Laroche-Joubert house, of four-fifths of the risk of the business, as well as of the profit, puts all those concerned in it on an equality, and gives them a common, or rather a mutual interest, which has a great moral value.

A RATHER important case was decided in England the other day, which is likely to serve, as English cases often do, as a precedent for the guidance of courts in this country; and as the circumstances which led to the dispute before the court are very likely to be repeated in country and suburban towns everywhere, those who inhabit such places will do well to make a note of the limit which the law seems inclined to put upon their liberties. In the case in question, which is known as Ballard *vs.* Tomlinson, the defendant, like so many other people not yet defendants, utilized, as he supposed, an old well, by converting it into a cesspool. As it happened, the subterranean stream which had supplied the old well also supplied, farther down in its course, the well of the plaintiff, who soon found himself drinking the diluted drainage from his neighbor's establishment, in place of the clear spring water to which he was accustomed. In default of other means, he betook himself to the law to obtain redress, but was repulsed with the decision that no person could claim property in an underground stream flowing beneath his land, in such a way as to prevent persons farther up the stream from draining it away, or diverting it, or making such use of it as they might choose. This judgment, which certainly seems open to the criticism that it would allow a person greater liberties with an underground stream than with one on the surface, did not satisfy the plaintiff, and he took his case to the Court of Appeal, which reversed the previous decision, and laid down what is now the common law of England on the subject, that although the owner of an estate may not be entitled to prevent the proprietor of an adjoining one, higher up than his, from draining his land in such a way as to intercept the subterranean streams which would otherwise reach the territory at a lower level, yet the owner of the lower tract has the right to demand, if the underground streams reach him at all, that they shall come to him unpolluted; and the higher proprietor is not to be permitted to dispose of noxious matters, even on his own land, in such a way as to contaminate his neighbor's spring. On general grounds, no one could object to so reasonable a decision, but an attempt to put the law in practice in some of our suburban towns or seashore settlements, in which, according to the official reports, the greater part of the wells receive sewage from the neighboring cesspools or vaults, would, we imagine, keep all the lawyers in the place busy for a long time. The subject is, however, of so great importance that it would be well worth while for a number of persons aggrieved in this way by inconsiderate or indifferent neighbors to join in prosecuting to final decision a single test case, by means of which the rights of all could be established, and relief secured for each one.

PRESSED AND ORNAMENTAL BRICKS.



MONUMENT IN GLASNEVIN CEMETERY.
OF
THOMAS HENRY BURKE. UNDER SECRETARY FOR IRELAND.
(Assassinated in Phœnix Park in May 1882.)
THOMAS DREW, R.H.A. ARCHITECT.

FRONT or pressed-bricks are commonly produced by a combination of the hand and the machine processes. The re-pressing of this class of bricks is sometimes accomplished in a press driven by steam-power, but the usual way is to mould the bricks by hand in a rough form called "gluts," which, before being dried, are slightly larger than the size of the press-box in which they are to be finished.

The operations of moulding, drying and pressing of front bricks are conducted entirely under shelter. The hand-press gang is composed of three members: the moulder, who also does the pressing; the temperer, who also does the wheeling of the clay; and the off-bearer, who also rubs the finished bricks with very fine moulding sand. The moulding of front bricks is usually conducted by task work, the same as for ordinary or common building bricks, when made by hand, and a day's work for the press-gang is to temper the clay, mould, press and finish one thousand one hundred and sixty-seven bricks.

Whatever method is employed for tempering the clay, whether it be by hand or by the pug-mill or by the clay-tempering wheel, it is necessary that the work should be thoroughly done. The clay should be very carefully selected, and should be weathered by exposing it during the winter. The clay, in addition to being not too strong, should be free from stones, gravel and other defective substances. Pressed-bricks are usually slightly larger than common bricks, being generally made of weak clay, in order to give them a rich color; but the same causes which operate to change the size of common bricks apply also to this finer grade of bricks. The moulder has his table placed in the moulding-shed at a convenient point near where the bricks are to be laid for drying, but before the work of moulding commences, the floor is luted over smoothly, and all "crumbs" or other particles which would cause defects in the gluts are removed, after which a very light sifting of moulding-sand is thrown over the floor.

The tempered clay having been piled upon the table in front of the moulder, he pulls a portion of it down with both hands, and after throwing a small quantity of moulding-sand over the lump of clay pulled down, both clay and sand are next worked into a peculiar form, called "the warp," and this he dashes with great momentum into the glut-mould which rests upon the moulding-cleat, both hands being used in the operation. The clay having been dashed into the mould, the moulder next pats and works it with the palm of his hand so as to make the corners and other portions of the mould solid. After patting and working the clay in this manner for a short time, the moulder next takes an instrument like a plasterer's trowel, called a "moulder's plane," with which he strikes off the superfluous clay piled above the top of the mould. It requires greater skill to mould the rough gluts than it does to mould the best quality of common building bricks, and it is highly essential that the gluts should be moulded free of flaws or sand-cracks, which would spoil the appearance and value of the pressed-bricks. The glut-moulds in common use in Philadelphia, Baltimore and Washington are known as the "single cast-iron moulds," and are light cast-iron boxes having both the top and bottom open and unobstructed, and the moulds are twice as long as they are wide. It is a great point in using these glut-moulds to keep the interior faces and corners perfectly clean, and this work is done by the off-bearer, who scrapes the inside of the boxes with an old case-knife which he carries suspended by a string from his side. The gluts having been moulded, the off-bearer carries the brick and lays it out upon the floor of the shed, the same as is done in moulding common bricks, and having deposited the bricks, he places the glut-moulds in a tub containing sand, at a point convenient to the moulder, and these operations are repeated until the number of bricks have been made which forms the day's task. The moulding-sand is an important item in manufacturing pressed-bricks, as the color and smoothness of the "skin" of the brick depend largely upon the quality of the sand employed. A No. 60 sieve is the kind commonly employed for sifting the dried sand for moulding pressed-bricks. The gluts, after being allowed to become quite dry, receive a light sifting of sand over their flat faces, after which they are turned over, in order that they may dry more regularly, and another light sifting of moulding-sand is spread over the upturned faces.

Sheds built expressly for the purpose of drying pressed-bricks are constructed with roofs which are capable of being opened so as to admit sun and air when required; but sometimes the roofs of the drying-shed are built in the same manner as for the drying-sheds used for common bricks, but the sides are fitted with slats which can be turned on pivots so as to assume a horizontal or other position, as may be desired for the admission of sun and air. It is important that the bricks should not dry too rapidly, as in such cases cracks are apt to form in the faces of the bricks which would spoil their market value, and in case too rapid drying has commenced, a piece of old carpet dampened with water can be laid over the bricks and occasionally sprinkled with water. The pressed-bricks are seldom hacked on edge in the drying-sheds, as in the case of common bricks, but are laid flat-wise, each pile being a separate one, and a space of about three inches is left around each hack; they hold a better shape in this manner of drying than if hacked on edge, but after the glut has been pressed in the hand-press they are differently hacked, as will be explained.

When the gluts are in a proper state for pressing, say when they can be handled without finger-marks, the press is taken to the bricks. Placing the press on the gang-planks or boards, the bricks are carefully put into the mould, great care being exercised that they are not marked in dropping them in. There should be no finger-marks on the gluts, and all "crumbs" must be wiped off of the moulds, and also off the lid. After the bricks are pressed they are generally laid flat, five or six high, and when partly dry they are lightly rubbed with the hand and piled pigeon-hole shape, which allows further drying; in some cases they are piled in squares, edgewise, five or six high. When dry, the pressed-bricks are placed on wheel-barrows, with strips of soft wood or woolen blankets between each course, and carried to the drying-sheds, where they remain until required for burning.

In manufacturing the first quality of pressed-bricks it is highly important that the press in which the gluts are finished should receive proper attention, and while the press is in use the mould-lid and plate should always be kept clean. The plunger-plate should occasionally be raised, and any dirt that may have accumulated on it should be wiped off, and a slight oiling occasionally given to all the parts while the press is in use. The proprietor of the works should make it a fixed rule that when the day's work of pressing is ended, the presser shall remove the plunger from the press, clean the mould-lid and plate, oil the surfaces, and afterward properly replace the plunger. Care should be particularly exercised that all the wearing parts of the press are occasionally oiled while the press is being used. The gluts, as well as the finished green pressed-bricks should receive constant attention during the drying process, as has been previously stated, and every precaution should be observed to protect the stock from unequal dryings. After the bricks have been thoroughly dried, they are ready to be set or placed in the kilns for burning. Pressed-bricks are, in the cities of Baltimore and Washington, usually set eight courses high in the kilns, but the writer has seen them carried twelve or fourteen courses in height in the city of Philadelphia. The top course of pressed-bricks does not usually extend closer than the second or third course from the top of the kiln; the final two or three courses, being composed of common bricks, as the top courses do not usually burn very hard, and have to be sent out for soft or "salmon" bricks. Pressed-bricks are set somewhat differently in the kiln from the manner in which common bricks are placed, the desire being to preserve the faces which are to be finally exposed in the walls of a building.

There is not the same amount of crossing or "checkering" of "pressed-bricks" as is the custom in setting common stock. The bottom, one middle, and the top courses are crossed or checkered in setting eight courses high, the pressed-bricks being set one directly over the other on edge; the "cross-ties" are to hold the bricks in a body and thus prevent them from "wobbling" or slanting from either side. Great care and experience in setting, as well as in burning kilns containing great quantities of pressed-bricks, are highly essential. If the bricks are not properly set they are liable to fall during the early stages of firing, for it may not be generally known that all things made of moulded clay, although they may appear to be perfectly dry when they first go into the kiln, again become soft and almost as plastic as they were when first moulded, and it is this stage of burning that causes so many defects in pressed-bricks. The early stage of burning is the most trying time for all clays, and it is the period in which the clay is yielding the water chemically combined with it, and, in the language of the brick-yard, the bricks are "going

through the sweat." It is impossible to so dry the bricks that they will not be subjected to this sweating operation after being placed in the kiln and fire started under them. Should even the adobes or sun-dried bricks of Egypt, which have been exposed to the influences of that moisture-extracting climate for more than three thousand years, be placed in a kiln and burned, the result would be the same; the adobes would "go through the sweat," and become soft and plastic before they were burned into hard bricks.

While the pressed-bricks are in the drying-sheds, a large proportion of the water mechanically combined with the clay is extracted from the bricks, but the water chemically combined can be driven out only by the process of burning. The necessity of thoroughly drying the pressed-bricks while in the sheds, and afterward carefully placing them in the kiln, will be manifest from the foregoing explanation. When the kiln contains pressed-bricks, too hard firing in settling the kiln must be avoided, otherwise the settling fires would be liable to cause all the pressed-bricks to "tumble" or fall, and the fires at this stage are consequently lighter but more frequent than when the kiln contains only common bricks.

The greatest precaution is always observed in handling the pressed-bricks before and after burning, much more attention being paid to these bricks than to common bricks. In carrying the bricks to the kiln they are taken up one at a time, placed lightly on the wheelbarrows, and between each course of bricks on edge there is placed a strip of soft wood or a good thickness of some kind of woollen stuff, such as an old blanket. When the bricks arrive at the kiln they are lightly removed from the wheel-barrows, one at a time, and are very carefully handled and tossed, also one at a time, to the setter; but no extra money is paid to the setting gang for handling pressed-bricks; the work is included in the task. After the bricks have been burned, great pains are taken, after removing them from the kiln, to preserve the sharp corners and edges, which are called the "arrises," and the bricks, after being tossed carefully, are placed on wheel-barrows and carried to sheds where the defective ones are culled out and the perfect ones assorted, for uniformity of color, the light-colored pressed-bricks being hacked together, and the medium and dark-colored bricks being also kept separate.

Ornamental bricks are usually made in the same manner as fine pressed-bricks. The quantities produced for a day's work are less, but vary with the size and complication of the designs. The hand-presses, in which ornamental bricks are pressed, after being moulded in the form of gluts, sometimes have larger mould-boxes than for ordinary pressed-bricks, and when small designs are to be finished, and which do not fill up the mould, suitable blocks of hard wood are used for "fillers" between the patterns. Ornamental bricks, of superior quality are now produced in large quantities in Philadelphia, Baltimore, Washington, St. Louis and Chicago, and these artistic executions in clay have done much to add to the beauty and variety of architectural constructions, by breaking up plain brick surfaces and substituting reliefs and intaglio ornamentation. When a person builds a dwelling for his own occupation, he usually makes an exact picture of his tastes, and exhibits a degree of his refinement and cultivation, whether the structure be costly or not, the same as he does in his dress and personal appearance, for plain people build, dress and live plainly, and as we have had a majority of this kind in the times gone by we now possess their pictures in the plain, unassuming buildings which survive them. But that period is now rapidly passing away, and attractive designs in architectural construction are to be seen in all locations, in suburbs and country as well as in towns and cities, and now our American builders are in many instances combining elegance of appearance with solidity of construction. It is not at all necessary to make a house expensive in order to make it attractive, for some of the most costly structures are the least so. Pleasing ornamentations in burned clay can now be produced so cheaply that a person who builds a brick house without employing them generally does so from lack of all desire for these embellishments of the exterior of his home.

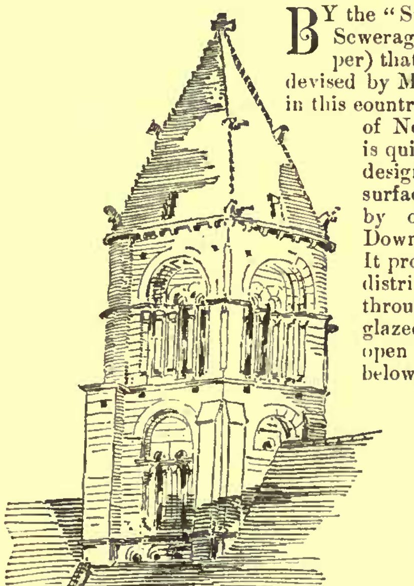
Some forms of ornamental bricks are pressed directly from damp clay after having been granulated; but the best qualities of ornamental bricks are made from tempered clay, and are moulded in the form of gluts and afterward pressed by hand in a suitable brick-press, as has been described. In the manufacture of ornamental bricks great care has to be observed that the clay is free from stones and small gravel, and also in the handling, rubbing or sanding and drying of the green bricks, great watchfulness is necessary, for if the drying be done too rapidly the ornamental bricks will have small cracks over their surfaces, which are great objections in the eyes of buyers. When the bricks are placed in the kiln, it is necessary that they should be carried along very gently for a time after the fire is started under them, as during the burning or firing the bricks are liable to "crush" or "squeeze," while the steam or "water-smoke" is being driven off.

Ornamental bricks, in addition to being produced in the ordinary red color, are also manufactured in caustic colors, as buff, brown, chocolate-brown, black, etc., and they are also enamelled in any desired hue, such as red, yellow, blue, green, etc. For ornamental bricks having encaustic colors, the coloring oxides are mixed with the clay in quantities usually of seven to ten per cent. The coloring oxides act as fluxes, and the composition of the body must be altered in some cases to counteract this. Ornamental bricks, like ordinary pressed-bricks, are sometimes colored under the glaze, and at other times the colors are in the glaze. When the color is to be applied under the glaze, the burned bricks are dipped into a slip of colored clay, formed usually of one part colored glass, ground, and two parts of clay, the latter causing adhesion of the slip, and the brick is either then fired, or, after being allowed to dry, it is coated with a transparent glaze and then fired; but the brick should be heated before applying the glaze, in order that all oily substances may be removed. When it is desired to apply the colors in the glaze, the brick is dipped into a transparent, colored glaze, usually formed, besides the coloring oxide, of oxide of lead, silicious sand and salt.

All enamels and glazes for ornamental bricks are usually applied to the one face or head which will be exposed after laying in the walls, except those intended to be used for corners and reveals of windows and door-jambs, which have one face and head treated, and are termed "rights and lefts" when they are so moulded or ornamented that they cannot be used for any corner. The colors now mostly used for architectural decorations and chromatic brickwork are the same, with the exception of buff and brown, as those employed by the ancient Egyptians, namely: red, yellow, blue, sometimes green, and white and black. In addition to the colors which have been given for ornamental bricks, there are others which are sometimes employed, especially for interior and expensive decorative purposes; they are turquoise, bronze-green, olive-green, violet, purple, orange, carmine, pink, gray and indigo.

CHARLES T. DAVIS.

SUB-SURFACE IRRIGATION SYSTEM OF SEWAGE DISPOSAL.[1]



Thaon nr Caen, France.
W.S.Fraser

BY the "Small Pipe System of Inland Sewerage," is meant (in this paper) that system of sewage-disposal devised by Mr. Moule, and popularized in this country by Col. Geo. E. Waring, of Newport, by whose name it is quite generally known. It is designated by some the "Sub-surface Irrigation System," and by others, the "Interrupted Downward Filteration System." It provides for the intermittent distribution of liquid sewage through a system of small unglazed earthen pipes, laid with open joints, from 8 to 16 inches below the surface of the ground, having such relation to each other and to the soil in which they are laid, both as regards its density and slope, that the liquid flowing through them will find its way readily into the ground, but, be sufficiently retained to reach the whole system of distributing pipes.

It is necessary for the success of this system that the ground employed should be drained, either naturally or artificially, so that absorption will take place promptly, and that there should be a flush-tank discharging its contents through an automatically acting siphon. There should be such relation between the size of this flush-tank and the soakage-area, that the whole system of pipes will be filled at one discharge of the tank, and such relation between the whole amount of sewage to be disposed of and the soakage-area employed, that the liquid from one discharge of the tank will have become absorbed by the soil into which it is distributed, before a second discharge. To adjust all these requirements perfectly, demands a nice judgment and a skilful hand. The nature of the soil must be taken into consideration. A clayey soil may be too retentive, and a soil composed mostly of sand may be too loose for the perfect working of this system; but, as the area required is small, it would cost but little to add sufficient sand to the former, and sufficient clay to the latter to render it suitable. When organic matter is absorbed into the soil near the surface, as provided for by this system of sub-surface irrigation, coming in contact as it does, in a state of minute subdivision, with the air and condensed oxygen[2] contained in the porous soil, it undergoes a rapid oxidation.

The change which takes place is in every essential particular equivalent to that of combustion. The organic matter thus treated

[1] A Paper read before the New Jersey Sanitary Association at their tenth Annual Meeting, in the Assembly Chamber at the State House, Trenton N. J., December 4th, 1884, by Dr. J. W. Pinkham, of Montclair.

[2] Schubler says: (*Journal Royal Agricultural Society*, vol. 1, p. 197.) The earths possess the remarkable property of absorbing oxygen gas from the atmospheric air, a phenomenon pointed out many years ago by A. Von Humboldt. . . . This property of the earths is confirmed almost without exception, provided they be employed for this purpose in a moist state. In the experiment which he instituted exposing one thousand grains of different earths for thirty days in vessels of 15 inches cubic contents (15 inches of air containing 3.12 inches of oxygen) he found that sandy loam absorbed 1.39 inches of oxygen, clay loam absorbed 1.65 inches and garden mould 2.60 inches.

NAME.	Size of family.	Approximate first cost of system.	Approximate cost of annual maintenance.	Length of time in use.	Is system free from nuisance?	Is all house waste satisfactorily disposed of?	Have stoppages occurred?	Is the soakage area under-drained?	Is it superficially dry?	Give any facts which you think may be of service in determining to what extent and under what circumstances can this system be recommended for general use.
C. M. Marvin, Montclair, N. J.	5	$200	$10	19 mos.	yes	no	no	no	yes	I believe it possible for the entire village of Montclair to be relieved, by disposing of its sewage matter by this system. The Women's Prison at Sherborn, Mass., uses this method, and there is a large amount of water consumed there. You are probably aware of the particulars in this case. The tanks discharge 15,000 gallons at a time, and they discharge alternately into two sets of drains of 10,000 feet each. At my own house I have had a switch put in the main sewer pipe so that I can use 200 feet alternately. By doing this I can distribute the liquid waste more evenly, and have a more uniform growth of grass on the surface of the ground. For in all cases the upper lines of pipe (those nearest the tanks) are apt to receive the larger quantity of waste, although they do not receive more than they can take care of. Yours truly, C. M. MARVIN.
P. S. Attick, Bryn Mawr, Pa.	hotel	2,000	——	5 yrs.	yes	yes	yes	no	yes	
Chas. Scheffilo, Plainfield, N. J.	8	——	——	5 yrs.	yes	yes	no	no	yes	I consider the system in every respect adapted to suburban, or any residence having a sufficient area of garden or lawn.
B. I. Tuthill, Montclair, N. J.	7	200	——	6 mos.	yes	yes	no	no	yes	So long as we have used it, it has been very satisfactory, and it seems to be the best system we have tried.
No Name.	10	200	12	2¾ yrs.	yes	yes	no	no	yes	
S. C. Burdick, Brick Church, Orange, N. J.	14	1,000	10	3 yrs.	yes	yes	no	no	yes	
E. Eaton, 19 Mercer St., N. Y.	6	350	12	6 yrs.	yes	yes	no	no	yes	I consider this system as satisfactory as any, if not more so.
C. Morgan, 83 Dey St., N. Y.	8	500	25	2½ yrs.	yes	yes	no	no	yes	You have the facts above, to which I have nothing to add save the opinion that it is a perfect success.
J. P. Davis, 21 Maiden Lane, N. Y.	10	170	——	2½ yrs.	yes	yes	no	no	yes	
J. E. Pulsford, 45 William St., N.Y.	15	400	20	3 yrs.	yes	yes	yes	no	yes	It can be recommended.
J. W. Towne, 140 Nassau St., N.Y.	14	300	10	10 yrs.	yes	yes	no	no	yes	
J. E. Knapp, 24 Pine St., N. Y.	9	250	15	3 yrs.	yes	yes	yes	no	yes	
W. F. Havemeyer, 112 Wall St., N. Y.	6	200	12	3 yrs.	yes	yes	no	no	yes	System is the best devised where there is sufficient room for pipes in dry lawn free from shade. I empty settling-tank about twice a year, though it is not absolutely necessary.
Dav. Bingham, New Produce Exchange, N. Y.	12	250	——	5 yrs.	yes	yes	no	no	yes	The system I consider perfect, wherever the party adopting it controls sufficient area for adequate distribution of the "small" or distributing pipes.
Ham. Wallis, 48 Wall St., N. Y.	9	350	10	2 yrs.	yes	yes	no	no	yes	
Gard. P. Lloyd, 110 Broadway, N. Y.	8	250	12	4½ yrs.	yes	yes	no	no	yes	I think with good care in making this system — iron pipes, etc., from house to cesspool — that it will work well in all cases where the land gives sufficient fall to pipes.
J. C. Howes, 52 Wall St., N. Y.	8	250	25	1 year.	yes	no	no	no	yes	I recommend it freely for general use where conditions and space of ground are favorable. The settling-tank needs cleaning out by removing the solid matter twice a year or oftener, and the ventilation-pipes need to be carried high above ridge of dwelling to prevent any odor being blown down by the winds.
R. C. Browning, 32 Cortlandt St., N. Y.	8	500	15	4 yrs.	yes	yes	no	no	yes	
B. Shepard, 26 Worth St., N. Y.	7	——	——	5 yrs.	yes	yes	no	no	yes	
P. M. Pompelly.	10	250	10	2 yrs.	yes	yes	no	no	yes	
Rowland Johnson, 5 Mercer St., N. Y.	8	380	10	19 mos.	yes	yes	no	no	yes	
Saml. Crump, Montclair, N. J.	10	175	10	3 mos.	yes	yes	no	no	yes	
E. A. Bradley, Montclair, N. J.	9	225	——	4 yrs.	yes	yes	no	no	yes	During the last three years there has not been the least trouble with the system.
Francis Speer, 135 Duane St., N. Y.	8	250	20	5 yrs.	yes	yes	no	no	yes	I have my tanks, or brick cesspools, opened every three months, and the solid matter removed and mixed with the manure heap.
Paul Babcock, Montclair, N. J.	8	——	30	2 yrs.	yes	yes	no	no	yes	Only fact I can mention is the very satisfactory working of the system at my home.
Chas. Cooper, Goshen, N. Y.	7	250	——	2½ yrs.	yes	yes	no	no	yes	As far as I can judge, where there is a fall sufficient for water to run freely it is without fault.
John T. Rockwell, 101 Duane St., N. Y.	7	400	15	2½ yrs.	yes	yes	no	no	yes	Have two 3-inch ventilating-pipes extending above the house-roof, one inside, and the other outside of the house, together ventilating the entire system. The above is my only experience with this method of disposing of house waste. Thus far it is satisfactory.
W. W. Underhill, Montclair, N. J.	12	185	none	18 mos.	yes	yes	no	no	yes	My experience and knowledge lead me to believe that this system might probably be safely recommended for general use in a town as thickly settled as Montclair; no facts leading to an opposite conclusion have as yet come under my observation.
Henry M. Oddie, 23 Nassau St, N. Y.	9	300	12	3½ yrs.	yes	yes	once	yes	yes	I can only speak from personal experience, that the system has been very satisfactory.
J. D. Palmer, Brick Church, Orange, N. J.	8	200	——	3 yrs.	yes	yes	yes	no	yes	I regard the system as fairly successful, and the next best to the small-pipe sewer system.
Chas. A. Sterling, 55 Broadway, N. Y.	10	400	12	1 year.	yes	yes	no	no	yes	I consider the system excellent if properly constructed, and sufficient area on the premises available for the distribution of the sewage. If the work is thoroughly and scientifically done I would recommend it for general use, but otherwise it (the system) would be worse than useless. I have the system in use on my property, corner E. Park St. and Washington, for about four years without any cost for repairs, and now working very satisfactorily.
R. C. Ryerson, Caldwell, N. J.	9	200	10	3 yrs.	yes	yes	no	no	yes	
Essex County Penitentiary, Caldwell, N. J.	150	500	50	4 yrs.	yes	yes	no	no	yes	The distributing-pipes were first laid so that fluid from the tanks reached only a portion of the soakage-area and there was consequently supersaturation. At present there is no difficulty with the system, and it gives entire satisfaction. Five thousand gallons of water are used daily. Since the introduction of this system there have been no cases of typhoid in the institution; previously there had been cases.
Geo. E. Simpson, Orange, N. J.	12	240	15	3½ yrs.	yes	yes	no	no	yes	I have studied the system and believe there is nothing in the world like it for suburban and country places.
W. H. Jewett, Montclair, N. J.	4	225	1[illegible]	1 year.	yes	yes	no	no	yes	
Mrs. G. W. Thorp,	5	550	12	18 mos.	yes	yes	no	no	yes	Brick Church, N. J., Nov. 28, 1884. Dr. J. W. Pinkham. *Dear Sir*, — I take pleasure in returning the enclosed blanks filled out as per request of Mr. Geo. P. Olcott, who inserted the system under discussion (with modifications of his own, and with which I suppose you are acquainted) in two of my lots in East Orange. A third place in Main St. is in working order, but has not had the test of time as yet. I shall be glad to furnish you with any particulars in regard to these three systems at any time. Yours very truly, Mrs. GEO. W. THORP, per J. G. Thorp.
J. G. Thorp, Brick Church, Orange, N. J.	4	450	12	16 mos.	yes	yes	no	no	yes	
Robert Lane, East Orange, N. J.	6	250	12	2 yrs.	yes	yes	no	no	yes	

In order that the negative and affirmative answers in the above table may convey no wrong impression, I desire to say that in the few cases where qualified answers were given, they are represented in the table by a "yes," which in the answer was "yes, to a small extent," and by a "no," which was "no, not to any extent" or words of similar import. Without this explanation the tabular statement would be less favorable to the system than were the answers received, which in no case represented that there had been serious difficulty, or that there was dissatisfaction with the system. J. W. P.

is just as much destroyed as if it were burnt, and the resulting products are as harmless as the products of combustion of wood or coal. Soil which has been used in this way for many years has been found to be but little changed, the liquid resultants of disintegration having evaporated or become absorbed by the roots of plants, while the solid resultants which remain, but slightly (and not in any essential particular), differ from the original constituents of the soil. Theoretically this system is perfect, but, the question, "will it work in actual practice," is legitimate, and is constantly asked. The best answer to the question "will it work," is the answer to the question "has it worked." The principal object of this paper is to present to this Association the testimony of those who have had practical knowledge of this system, — of the engineers who have constructed the works, and of the owners of places on which the system has been tried. The word "tried" has been used intentionally, for no system can be recommended for adoption, however perfect it may be in theory, until it has been subjected to the crucial test of prolonged trial, and it is important to know, not what a system will do under skilful management, but what it will do under the somewhat negligent management which it is likely to receive. A system which requires for its operation the constant supervision of an expert, will fail on account of the impossibility of obtaining such expert supervision. In studying this system at the present time, we are fortunate in being able to form our conclusions concerning its merits, not from the reasonableness of its theory, nor the weight of opinion which supports, but from the testimony of those who have tried it.

In collecting this testimony, I have been aided by Mr. James C. Bayles, and Mr. Geo. P. Olcott, Civil Engineers of Orange, who have kindly furnished me with the names and addresses of their patrons. To secure the desired information I addressed the following circular to about sixty people, who for various lengths of time have employed the subsurface irrigation system: —

Dear Sir, — Wishing to collect facts concerning the practical working of the "*Small-pipe System of Inland Sewerage*," and learning that you have had opportunities for observing its operation and forming an opinion of its merits, I take the liberty of sending to you the enclosed blank, which I will ask you to kindly fill out and forward to me by return mail.

Yours, respectfully, J. W. PINKHAM.

State. — 1. Size of family. 2. Approximate first cost of system. 3. Approximate cost of annual maintenance. 4. Length of time in use. 5. Is system free from nuisance? 6. Is all house waste satisfactory disposed of? 7. Have stoppages occurred? 8. Is the soakage area underdrained? 9. Is it superficially dry? 10. Give any facts which you think may be of service in determining to what extent and under what circumstances this system can be recommended for general use.

The answers to these questions I will present to you as they have been received, omitting only the portions which are irrevelant. These answers [see preceding Table] constitute the testimony which I have collected concerning the practical working of the sub-surface irrigation system for the disposal of house sewage.

Dr. Whitehorne, physician of the Essex County Penitentiary, in addition to his answer to question 10, further says:

"I would say that the fact of the utility of the system is patent, and under proper conditions is available for the healthful disposal of the sewage equally of the smallest family or the largest public institution. Before the change was made here the solid fæcal matters were composted and made use of on the farm, but a large portion of the immense amount of liquid, holding noxious matter in suspension, found its way into a neighboring brook, and contaminated both the air and the running water, being perceptible as far as Caldwell village, three-fourths of a mile distant. At present the solids are equally available for composting, and the saturated liquids, by means of the system of laterals, are disposed of without defiling the running water below. During summer the ground above is made use of for a kitchen garden, and produces abundantly, so that thus controlled, these elements otherwise poisonous, are made subservient to the good of man. Trusting that the foregoing may be acceptable to you, I am,

Very truly yours, H. B. WHITEHORNE."

I will add to this the opinions of several civil engineers who have had ample opportunities for observation.

Mr. Geo. E. Waring says: "The sub-surface irrigation system is much the simplest, the safest and the best, its cost is trifling, even where the water from the kitchen and laundry trays in the cellar has to be lifted with a pump to the level of the drains."

My own system has worked perfectly, summer and winter, for seven years. I have never heard of a case of failure.

Mr. Edward S. Philbrick says: "There are so many places where this system is applicable and its merits are so great in such places that a full and detailed description of it may be of interest. The limits of its application are as follows: Wherever a quarter of an acre of grass land is available for a single family of eight or ten persons, or an acre for an aggregate of eighty persons, so situated that the surface of the sod is five feet or more below the level of the house drain, where it leaves the house or houses, this system will dispose of all their sewage in a satisfactory manner, summer and winter, with very little attention, for a term of years."

I now submit the question to you without argument. I will venture, however, to make the following summary of conclusions, which I think are fairly deducible from the foregoing testimony.

In Orange, Montclair, Caldwell and Dun Ellen, New Jersey, in Goshen, New York, and in Bryn Mawr, Pa., the system of sewerage known as the Sub-surface Irrigation System constructed under the superintendence of Mr. Geo. P. Olcott and Mr. James C. Bayles, of Orange, and Mr. James Owen, of Montclair, has, after (in many cases) prolonged trial, proved a success.

2. The first cost for a family and house of average size, is about two hundred dollars.

3. The cost of annual maintenance is about ten dollars for such a house.

4. The ground selected should be free from shade, and may be either lawn or garden.

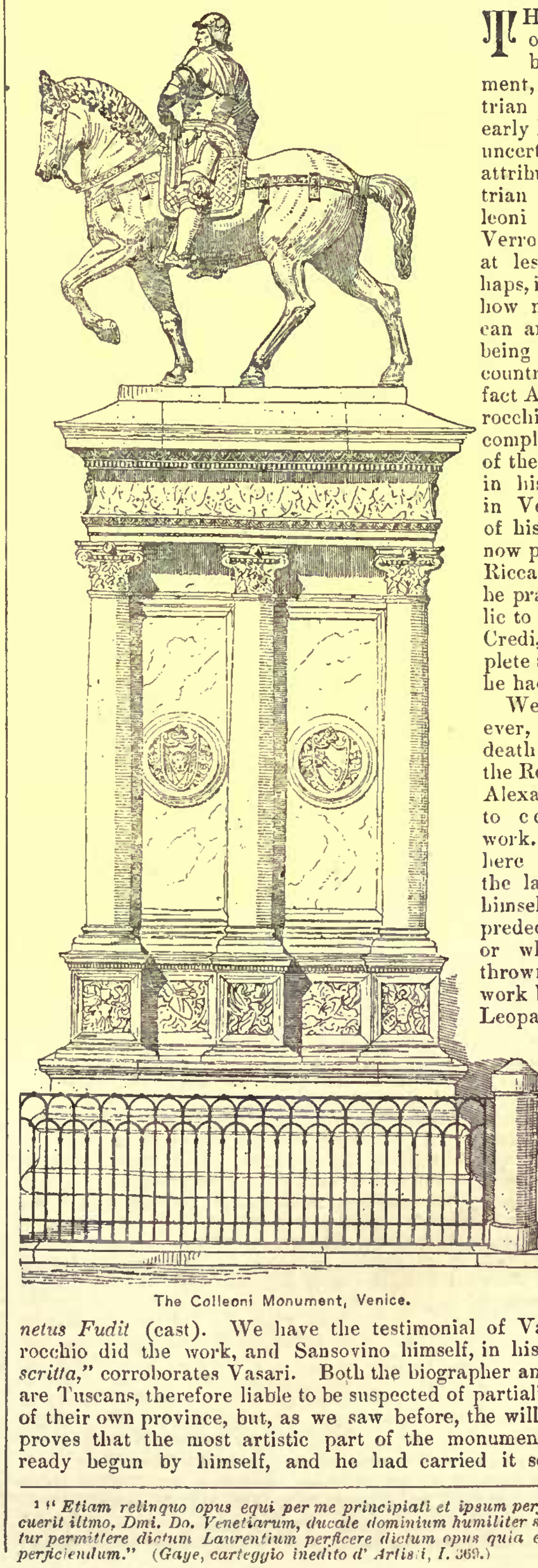
5. By means of this system all liquid sewage from the smallest dwelling house or the largest institution, may be effectually disposed of without nuisance and without peril to health.

6. This system should take the place of cesspools in all suburban and country places which have sufficient ground for the distribution of pipes.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

THE COLLEONI MONUMENT, VENICE, ITALY.

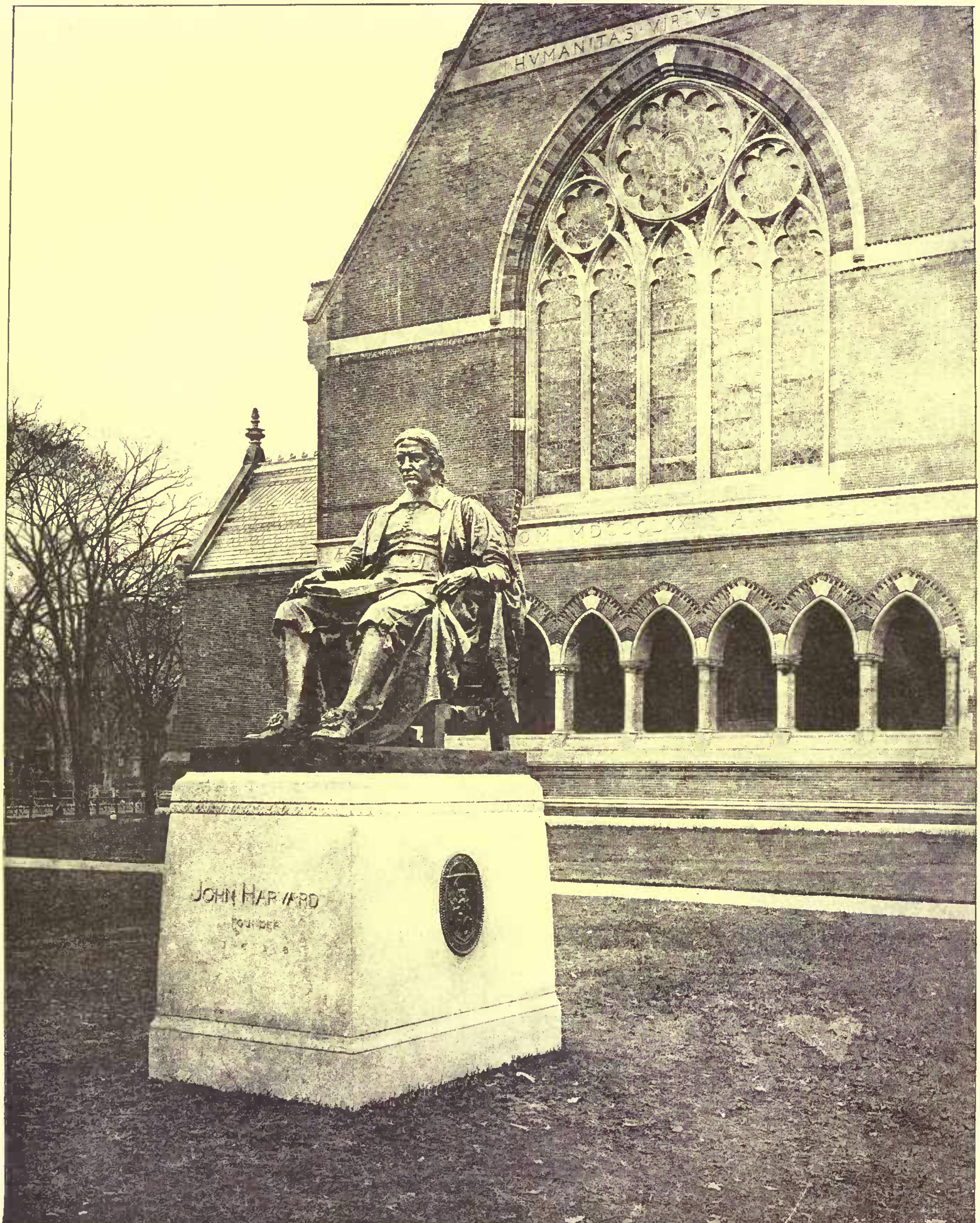


The Colleoni Monument, Venice.

THE authorship of this so celebrated monument, our best equestrian statue of the early Renaissance, is uncertain. Vasari attributes the equestrian statue of Colleoni to Andrea del Verrocchio; he was at less pains, perhaps, in investigating how much the Tuscan artist had done, being one of his own countrymen, but in fact Andrea del Verrocchio had not even completed the model of the horse, because in his will, written in Venice the year of his death (1488), now preserved in the Riccardian Library, he prays the Republic to let Lorenzo di Credi, his pupil, complete the work which he had begun.[1]

We know, however, that after the death of Verrocchio, the Republic ordered Alexander Leopardi to continue the work. The doubt here arises whether the latter availed himself of what his predecessor had left, or whether it was thrown away and the work begun anew by Leopardi. On the girth under the stomach of the horse there is the following inscription: "Alexander Leopardvs V. F. Opvs," which may be read either *Venetus Fecit* (made) or *Venetus Fudit* (cast). We have the testimonial of Vasari that Verrocchio did the work, and Sansovino himself, in his "*Venetia Descritta*," corroborates Vasari. Both the biographer and the historian are Tuscans, therefore liable to be suspected of partiality for an artist of their own province, but, as we saw before, the will of Verrocchio proves that the most artistic part of the monument had been already begun by himself, and he had carried it so far forward,

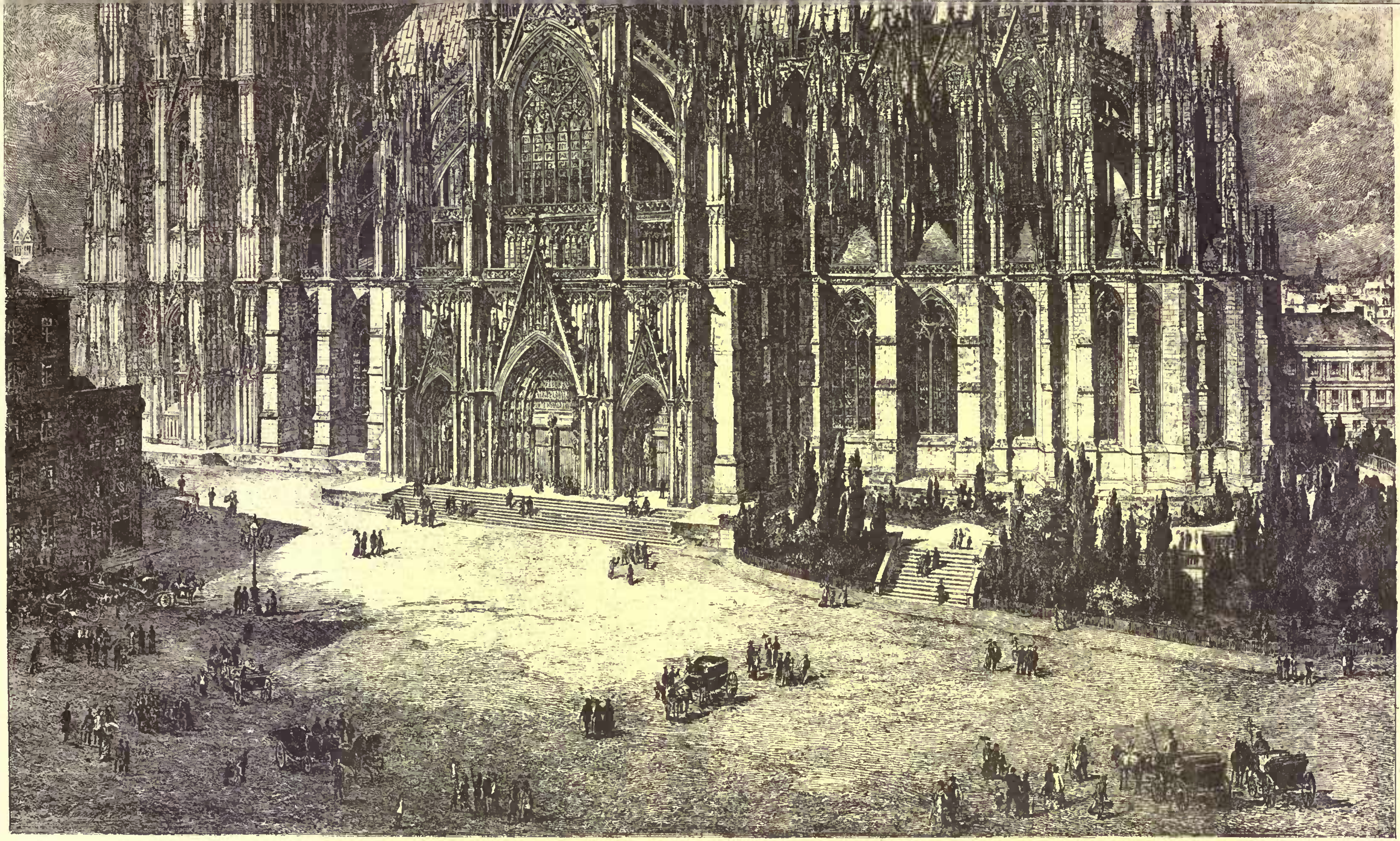
[1] "*Etiam relinquo opus equi per me principiati et ipsum perficiendum, si placuerit iltmo. Dmi. Do. Venetiarum, ducale dominium humiliter supplico, ut dignetur permittere dictum Laurentium perficere dictum opus quia est suffitiens ad id perficiendum.*" (*Gaye, carteggio inedito d' Artisti, I. 369.*)



HELIOTYPE PRINTING CO. BOSTON

Statue of John Harvard, Cambridge, Mass.
Daniel C. French, Sculptor.





The Heliotype Printing Co. 211 Tremont St. Boston.

Cologne Cathedral.



HELIOTYPE PRINTING CO. BOSTON

The Colleoni Monument, Venice.

that at his death his only anxiety was that it should be finished by some one he trusted.

We do not know why the Republic did not conform to the wish of so great an artist, after his death; but perhaps, though it had been induced to invite the Tuscan sculptor to do the work on account of his renown, it was not equally disposed to let any other stranger finish it, and the fame of the Venetian, Leopardi, then already spreading, determined the Republic to dismiss the disciple of Verrocchio, Lorenzo di Credi, and to give an opportunity to a citizen of the Republic to have the glory of completing the work.

We may gather this from the avowal which on the tomb of his family at the *Madonna dell' Orto*, he recorded himself, while still living, as having made the pedestal of the horse of Colleoni. And also from the tone of the most creditable writers of the period. Here is what Marin Sanudo says in his *diarii* (date 1493; I, 96):

"This day, Monday, March 21, in Venice, the bronze horse of Bartolomeus Colleoni, our late captain-general, placed in the campo SS. Gio. Paolo, was uncovered. It is a very fine work, which the masters have just finished gilding. Everybody went to see it. The artist who did it, besides much money from the Council of X when the work was completed, had a yearly pension of 100 ducats granted to him for life. On the pedestal which supports the horse are these words: 'Bartolomeo Coleono Bergomensi ob Militare Imperivm optime gestvm;' and on the other side, 'Ioanne Mavro et Marino Venerio Cvratoribvs Anno Salvtis MCCCCLXXXXV;' and under the girth of the horse, 'Alexander Leopardvs F.'" GIACOMO BONI.

STATUE OF JOHN HARVARD, CAMBRIDGE, MASS. MR. DANIEL C. FRENCH, SCULPTOR, CONCORD, MASS.

THIS ideal statue of the founder of Harvard College, the gift of Mr. Samuel J. Bridges to the University, was unveiled October 15, 1884. Of the subject of this statue, which was cast by the Henry-Bonard Company of New York, the Rev. George Ellis says:

"We know neither his birth-time, nor birth-place, nor lineage, nor parentage. His name appears on the entry book at Emmanuel College, Cambridge, in 1628. He was matriculated there as pensioner, — that is, one who can pay his own charges, — July 7, 1631. The signature for his bachelor's degree is dated 1631, and that for his master's degree, 1635. There all we know of John Harvard in England stops. He is called 'Reverend' here, and was known as a preacher. But we are in ignorance whether he had been episcopally ordained in England, and thereis no record of his ordination as a dissenting teacher there or here. The artist would know the number of his years. We cannot tell them. All that we have to guide us is that, supposing him to have been of the average age of twenty on taking his bachelor's degree, he would have been twenty-seven at his death here. Milton, who was born in 1608, was matriculated at the same University, though at another college, — Christ's, — which he entered in 1624, at the age of sixteen. But he did not reach a degree. . . . We do not know at what port of exit, in what vessel, at what date, or with what companionship, Harvard embarked for this country, nor the time of his arrival. His presence here is first recognized by his admission as an inhabitant of Charlestown, August 1, 1637, and as 'sometimes minister of God's word' in that town, assisting Mr. Symmes, the pastor of Charlestown Church, of which Harvard and his wife were admitted members. He received grants of land from the town, and on April 26, 1638, was on a committee 'to consider of some things tending towards a body of laws.' The site of the house which he built is known. Judge Sewall speaks of lodging in a chamber of it, January 26, 1697. It was probably burned in the battle, June 17, 1775. Harvard died of consumption, in Charlestown, September 12 (O. S., Sept. 22 N. S.), 1638, only a little more than a year after the first mention of his presence in New England. By a nuncupative will, of which there is no record or administration, he is said to have left all his library, 'and half of his estate, being £800,' to the college, which the court had two years previous voted to establish at the 'New Town,' afterwards called Cambridge. Such is the ambiguity of language, that it seems impossible to decide whether the whole or half of his estate was £800. Nor do the accounts and receipts of the bursars of the college satisfactorily settle the doubt. If Harvard was possessed of £1600, it was a very large estate for those days. Probably it was invested in England, causing delayed and fragmentary returns. . . . Money values two and a half centuries ago were five or six times those recognized by us.

"President Quincy states the number of books in Harvard's library, from the list in the college archives, as two hundred and sixty volumes, rich in the best works of classical and other literature. Another account puts the number at three hundred and twenty volumes. All but a single volume were burned in the destruction of Harvard Hall, in 1764. Though many of John Harvard's contemporaries, who, though he had been so short a time in this country, must have known something of his personal history, — speak gratefully of his generous gift, — not one of them has left for us the slightest information of facts which we should be glad to know of this youthful, delicate scholar, fading away of consumption early in the second autumn of his exile.

"In that precious relic of the press, called '*New England's First Fruits*' printed in London, 1643, we read that while the colonists in Boston were earnestly intent in their first struggles to make provision for learning and to avert an illiterate ministry, 'it pleased God to stir up the heart of one Mr. Harvard (a godly gentleman and a lover of learning there living among us) to give the one half of his estate, it being in all about £1700, towards the erecting of a college, and all his library.' While the descendants of large numbers of the earliest New England colonists, whose genealogies have an interest only for their own families, have easily traced their localities and lineage in the mother country, all efforts — and they have been many and earnest — spent upon the subject of my remarks have wholly failed of rewarding results. Your predecessor in the chair, Mr. President, the keen, sagacious and unwearied Mr. Savage, — our chief in the labors of research, — failed to accomplish in the case of Harvard what he did for so many other of our worthies. We recall the fervor of his utterance here when he spoke, as he has published in print, to the effect that he would give a guinea for each word, or a hundred dollars for each of five lines, of information about John Harvard in England."

ST. JAMES'S CHURCH, CORNER SEVENTY-FIRST STREET AND MADISON AVENUE, NEW YORK, N. Y. MR. R. H. ROBERTSON, ARCHITECT, NEW YORK, N. Y.

THIS church building was completed in January of this year as shown by perspective, with the exception of the belfry stage of tower and lantern of same. The material employed throughout the exterior is Longmeadow stone of two slightly varying shades, the ashlar being rock-faced and the finish dressed. The seating capacity of the church is 950, including the accommodation of the rear gallery. The Sunday-school room is provided for in the basement, which is also arranged for special class-rooms, choir-rehearsal rooms, etc. The necessary guild and society rooms are in the wing, as indicated on the plan. The cost of the building complete was $130,000. It is proposed to complete the tower as drawn, at an early date.

THE CATHEDRAL, COLOGNE, GERMANY. AFTER AN ETCHING BY B. MANNFELD.

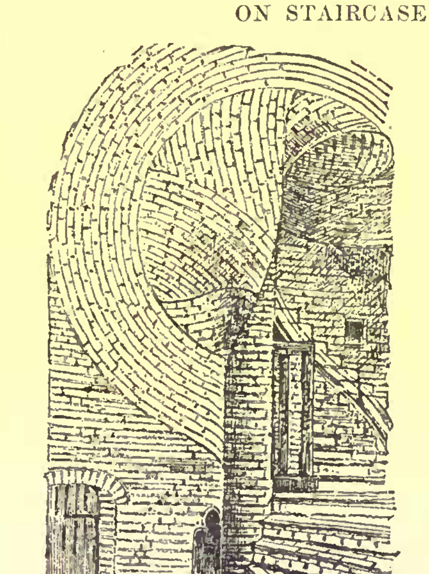
ON Saturday, August 15, 1880, the cap-stone of the last of the west towers to be completed was set in place, and on October 15 and 16 of the same year was held a great festival during which the building which had been for so many centuries in the hands of the builders was finally dedicated to the service of God. The history of the building and all that relates to the completion of the towers and other unfinished portions has been so often referred to of late years that it is not necessary to go over the ground again.

THE TOWN-HALL, YPRES, BELGIUM.

[Gelatine Print, issued only with the Gelatine Edition.]

THIS building, which was begun about 1230, and was in the hands of the builders something over a hundred years, or until 1342, was formerly the guild-hall of the great guild of the clothiers, one of the strongest of the great merchant associations of the Netherlands, and is still known as the "Cloth Hall." It is built of brick, and is 436 feet long. The Renaissance structure on columns at the east end was built about 1730. The main façade is decorated with forty-four statues, in couples, representing the Counts of Flanders down to the time of Charles V. These were restored about twenty years ago.

ON STAIRCASES.



Staircase · House of Tristran the Hermit Tours France

THE first of two lectures on this subject was delivered on the 2d ult. to the students of the Royal Academy, by Mr. G. Aitchison, A. R. A., who said that the history of stairs and staircases might be interesting from an antiquarian and ethnological point of view, but here it was the practical question of how they could be made better and more beautiful than heretofore. The steps found in the rocks probably suggested to some pre-historic genius an easy means of conquering steepness. That steps were known at an early time was shown in the rock-cut temples of Egypt. The chronology of Egypt professed to begin 3,900 years before our era; the kingdom of the Pharaohs dated from 1830 to 1312 B. C., and it was to the latter period that the rock-cut tombs with steps and the staircases in the Palace of Rameses belonged. The Chaldean temples, too, were supposed to have had grand flights of steps. The early chronologies were somewhat vague, some giving the date of 1635 B. C., other 1571, and even 1312 B. C.,

as the date of the birth of Moses; when steps were first mentioned in the Bible it was after the flight from Egypt. Whether Jacob's Ladder was a flight of steps, or a ladder, he would leave the learned to decide.

Solomon's birth was said to have been somewhere about 1000 B. C., and they read that when the Queen of Sheba had seen the house which he had built, "and his ascent by which he went up into the House of the Lord, there was no more spirit in her." Then, as now, the employer, and not the architect, got the credit! Persia was probably the country where flights of magnificent steps were principally to be seen, evidently used to give dignity and impressiveness to the buildings. Those in front of the great walled plateau of Persepolis were 34 feet high. The palaces of Darius and Xerxes had very fine staircases, which preceded but a little those to the Propylæa on the Acropolis, which must have been the most magnificent in the world. The vestibule at the top of these stairs was splendid and unique amongst Greek buildings; that is to say, amongst the most perfect architecture the world had seen, and which deserved some mention beyond the immediate purpose of the lecture. It was building at the very acme of Athenian taste, and was looked on as the personification of Athenian supremacy. It was considered the gem of Athens, and united at once the most perfect simplicity, the greatest subtlety of composition, and the greatest originality of any Greek building that had come down to us. Placed on the crag platform of the Acropolis, it was the main feature of Athens, its stairs conferred imperial beauty on it, and gave dignity to the columns of its portico. Mr. Penrose had shown conclusively that the flanks had no pediment. Within the central portico and at right angles to it was a double row of Ionic columns, flanking the carriageway. We have reason to wonder that such noble works should have been built in so short a time. Plutarch, writings 500 years afterwards, says "even now they have the freshness of modern buildings, and a bloom is diffused over them, as if they were animated with a spirit of perpetual youth and unfading elegance."

By referring to Vitruvius they would find the way in which steps should be made. At the Propylæa and in other Greek temples there was a chase cut out on the bottom of the riser, and another on the back of the tread; the chase looking as if it were cut to catch the rain-water, when the rain ran down the riser; it was apparently caught by this channel. Mr. Penrose found there was no exit to these, so that after rain the channels were full of water. There were some curious points about these channels, some being worked on the riser, and some on both the tread and riser. His hearers might doubtless think that this would be more interesting to the mason than to the architect; still these matters were not so trivial, particularly as the material used was costly marble, and the superfluous marble left, which the chases marked, was to protect the face and edges. They might say that they could not be roused to enthusiasm about steps, but he would try to persuade them that much might be learned from such humble accessories. Was it not possible that these sinkings were found to give accent to the stages, and were eventually used for æsthetic purposes? The beauty of stairs depended on good proportion and the realization of proper effect; the hand of a master could be traced in the smallest detail of a building. If the mouldings of a building were coarse and ill-proportioned it could be seen that the architect was a savage, although he might be a clever one. In the case of steps, when the treads were too narrow, the whole flight rose up before one like a wall, while, if the risers were too low, the lines which were the beauty of the steps were lost.

When he first thought of this lecture he believed he had merely to go to the Institute or the British Museum Library to get full details of every flight of steps or grand staircase he had seen; but it was almost like digging for diamonds on Salisbury Plain! One example that had struck him as being most important, the *scalinata*, was not to be found, nor were there any details of those two grand staircases, — the one at the National Gallery and the other at the Royal Academy, when both were housed at Trafalgar-square. Nor was a plan of the staircase of Santa Maria in Ara Cœli to be found. If the competitors for the Silver Medal could be set to work on the great buildings of England, and if their drawings could be published or preserved and bound, what an important gallery of English architecture the Academy would possess! External staircases presented infinite possibilities of display, as one was not hampered by want of space or the fear of spoiling the interior arrangements of the building. The *scalinata*, or grand flight of steps, at Santa Trinità dei Monti in Rome, was certainly superb. It consisted of one grand straight flight with three landings, divided into three by square pedestals, the central portion being about three-fifths of the whole width, and above circular flights, the whole being crowned by the two-towered church of Santa Trinità dei Monti. Sir John Soane had evidently taken from this his suggestion for a Scala Regia, published in his work. Another splendid staircase in Rome was that leading to the Church of Santa Maria in Ara Cœli, built in 1348. However inferior in position this staircase might be, it to some extent suggested the magnificence of that to the Propylæa. Though the staircase at the Ara Cœli was not nearly so magnificent as the *scalinata*, it was, perhaps, more striking on account of its perfect simplicity. The art in the other was only too apparent, while the highest art was to conceal it. Every architect who looked at a perfect Doric temple must wish that he had lived before the Greeks, feeling sure that he would have done it in the same way. It looked so simple that it would seem as if he could have fallen on no other form than sublimity. In the same way, on first seeing the inside of the Pantheon one was almost angry with the nameless architect who had lighted the vast dome by a single eye, before one had the chance of doing so. He wished to impress on his audience the advantage of the infinite pains which must be taken, and of the self-denial to be exercised, if they hoped to produce the highest work which should live.

Perhaps the most historic open-air staircase was that of the Giants at Venice. This *Scala dei Giganti*, with its two colossal statues of Mars and Neptune, was not the place of execution of the Doge Marino Falieri, as it was not then built. This staircase was a little over 13 ft. wide, and consisted of twenty-eight marble steps, with landings in the middle and at the top. In Mediæval times a large proportion of the staircases was in the open air, built on to or corbelled out from the wall, like that of the Bargello at Florence. There was a very fine flight of the same sort at the Courts of Justice in Barcelona. This was a wide flight, like that of the Bargello, and at the top where it entered the arcade which surrounded the courtyard, the angle column on which the two arches would rest was suppressed, and there was nothing but a boss. Viollet-le-Duc gave a representation of an outside staircase leading to the ramparts at Carcassone, which was of interest. The lecturer drew attention to several examples, of which drawings were displayed on the wall. One was an open-air staircase, with a pretty open-work Gothic balustrade, probably from Nuremberg. Another was a view of the Ripetta at Rome, showing a series of three steps and a landing, — a double curve on plan. These had been swept away by the foundations of a new bridge. The President had kindly lent him a sketch of the summer pulpit at Jerusalem, and on the wall was a drawing of the celebrated staircase in the cathedral at Burgos, lent by Mr. O'Connor, which had so great a charm for painters. It was an inside staircase, with many of the features of an outside one. In Canterbury Cathedral would be found a noble flight of steps leading from the transept to the choir, which would have been effective if it had not led to a dead wall. And here should be named Sir Charles Barry's magnificent stairs in Westminster Hall, stretching nearly across it. Nearly every considerable church or cathedral, both at home and abroad, has, or has had, a more or less imposing flight of steps. The fine open-air staircases of England were mostly to be found in the gardens and terraces of the Tudor and Elizabethan age. Sir Charles Barry was very successful with this form of garden and terrace staircase. In Italy there were numerous specimens of stairs in gardens and terraces.

Before going farther he would like to draw attention to the splendid flight of stairs by Wilkins to the portico of University College, London. This was well worth studying, and any who were looking forward to doing grand public buildings should spend some time in measuring it, and seeing how the grand effects were produced. To get these effects required commanding genius and severe study. The first point to be observed in arranging steps and staircases was the proportion which would make them look well, and yet would not prevent their convenient use. This was done by making the risers shallow and the treads wide. Breadth was also of the first importance. Splendid specimens of staircases in gardens and terraces were to be found about Rome and its environs, and J. Gwilt was of opinion that the stairs at Versailles showed magnificence and artistic skill. Any one could now consult books on the subject, but there were so many points that even the best views would not give, that it was rash to speak of effects until they had judged of them with their own eyes. He would like, however, to refer to the beautiful garden and architectural effects of the Villa d'Este, near Tivoli. There was one rule which should not be lost sight of in outdoor steps, — that of giving each tread a slight fall to the nosing, so that the rain-water might run off. He never walked on the grand pier at Brighton without thinking what a fine street could be made from the square to the heights above, finishing with a grand flight of steps, and crowned with some cathedral, town-hall, or museum. He was afraid that Londoners would have to wait for the crowning of their "Mons. Sacer," Primrose Hill, with a grand flight of steps and a pulpit for addressing the people, before they could hope to rival the Propylæa at Athens or Santa Trinità dei Monti at Rome.

Mr. Aitchison's second lecture was delivered on Friday, the 6th ult. Mr. Aitchison said that staircases might be divided into the following classes; first, the cockle, corkscrew, lantern, winding or newel staircase, sometimes called a vyse; second, the straight staircase between two walls; third, those which went round two, three, or four sides of a rectilineal figure; fourth, a central ascent with two branches, etc.; fifth, the circular, semicircular, or oval well staircase; and, sixth, the compound staircase, with straight flights in conjunction with curves, etc. Properly speaking, the word "staircase" implied its own use, namely that of a case, but, as was well known, a long flight of stairs out of doors would be called a staircase. Staircases were important features in buildings, as they presented opportunities for all that the architect, sculptor, and painter could do in the way of adornment, and also for the effects due to light. Lighting from the whole ceiling, vault, or dome was the best, and there was a gravity and uniformity about this mode which caused it to surpass all others. The next best plan was by a lantern, but, if this were adopted, the vertical windows must be ample. Windows on the stairs or landings were dazzling to the eye, but a fine method of lighting was by recesses lighted from the top and partly from the sides, and

screened from sight. Winding stairs were used throughout the Middle Ages, and captivated the leaders of the Renaissance. M. Viollet-le-Duc gave some examples of corkscrew stairs, and notably one from Mayence Cathedral. The celebrated screw staircase at the Louvre was another fine example.

Mr. Aitchison then described the central staircase at Chambord, and also that in the court-yard of the Castle of Blois. A Greek, in the age of Pericles, would have considered this staircase barbaric, but its depth of shadow and relief conferred boldness and originality upon it. Inside, the newel had a moulded skirting, and was divided above into panels by slender shafts, the panels enriched with delicate arabesque. The staircase at Chambord, since the floors of the great hall had been removed, had a most surprising and astounding effect. One seemed to be in a lofty cathedral, with a piece of tabernacle-work rising up through the roof. Though this staircase was not so rich as that at Blois, it was still very effective, and its fame even reached the ears of Palladio, who mentioned it in his book, though he thought it was a well-staircase, and had four staircases rising one above another, instead of its being a newel-staircase, with two stairways like those by Mr. Bodley at the School Board Office.

Another celebrated circular staircase was the Scala Minelli, at Venice. In the leaning tower at Pisa the winding staircase went spirally up between the inner and outer walls, and, though devoid of ornament, was very striking. The great drawback of these newel-staircases was the want of vista, and the truly royal staircase was the straight one. Of these he would mention that of Bernini at the Vatican, which had been managed with the most perfect art. The great objection to a columned staircase was the raking of the vault, which looked unsafe and unpleasant. Sir John Soane was aware of this fact, and in his royal staircase he got his vaults springing from a horizontal line by keeping the stairs within the stylobate. He must not omit to mention the Scala Santa, or holy staircase, of St. John Lateran, said to be the stairs of Pontius Pilate's house. It consisted of twenty-eight marble steps cased with wood, and a two-story building was erected to take this staircase, with four other staircases, to meet the wants of the faithful.

The Norman staircase leading to the school at Canterbury was a type of a common form used in the Middle Ages. It consisted of four large Norman columns, each with a square abacus; a wall about two-thirds of the height of the columns ran up on the rake, and was capped with a plain projecting coping. The shafts diminished in height as they went up the slope, so that their capitals were level, and the whole was covered with a pent-house roof. He was very much struck with this when he first saw it, and his admiration had not diminished with time; indeed, it was one of the most effective small out-door staircases he had ever seen. The Normans were great architects and sculptors, and it seemed a pity that so much of their sculpture had been restored by those ingenious persons who should carve comic pipe-heads and umbrella-handles.

In the third class he would mention Sir Charles Barry's staircases at the Reform Club and Bridgewater House, going round three sides of a square between walls. Mr. Ewan Christian wished him to remark that in every house a staircase between walls should be built, as it was the only fire-proof staircase, and would save life in case of fire.

Mr. Aitchison then drew attention to some drawings of the celebrated staircase by Inigo Jones at Ashburnham House, and of which Sir John Soane thought so highly that he had drawings of it specially made for his Academy lectures. From the inner hall, a low, plainly-panelled room, about seventeen feet by twenty-three feet, the visitor passed up a flight of ten steps in the middle of the west wall, and was landed in the staircase-hall, where three more steps took him to the foot of the grand staircase. He then found himself in an elegant hall, about twenty feet high, twenty-seven feet seven inches long, and fourteen feet wide, with two windows at his back. The walls on the first-floor level were ornamented with Ionic pilasters. At the top of the stairs was a recess of about fifteen feet by seven feet six inches, the lines of the hall being preserved by two engaged columns and an isolated one in the middle, its pedestal forming that of the balustrade. The hall had a coved cornice, and in the centre of the ceiling was an oval lantern, domed at the top, supported by twelve Ionic colonnettes, grouped together in threes, and with balustrades between the groups. The grand staircase had but seventeen steps: one flight of nine, then a square landing, and then another flight of eight landing in the line of the columns forming the front to the recess. The landing in this recess, about seven feet six inches square, gave access to the dining-room and ante-room. The first flight was five feet eight inches wide; the second about seven feet; the risers being five inches high, and the treads fourteen inches wide.

It was difficult, even with the drawings, to convey the full effect of the art and ingenuity displayed. The low, plain inner hall acted as foil to the elegance and proportion of the staircase hall. The twelve feet six inches of height to the first floor, gained by thirty steps, was half cut off insensibly by the steps from the inner hall, and the three to the staircase floor. He doubted if anything so original as the lantern existed. It was constructed in a common hipped roof, tiled, and with four dormers, and no one looking at its external homeliness would guess at the elegance within. There used to be elegant staircases in some of the old city houses, but these had been swept away to make room for modern tasteless rubbish, built on the leasehold system. He hoped that some day the Academy would acknowledge the claims of architecture, and would extend its liberality to endowing a Professor of Construction, and thus remove the present reproach that the schools turned out draughtsmen and scene-painters, but not architects.

The Palazzo Braschi at Rome contained a celebrated staircase going round three sides of a parallelogram, with a well in the middle. The stairs were about ten feet wide, and the hall was lighted by three windows on one side, by windows in the cove, and a small skylight in the top. One point which had never been conquered in this kind of staircase was the distortion of the arches, but still this one was a striking example. There was a similar one at Naples. The architectural details were poor, but the corridors had their windows facing the street, and when he saw it, on coming from London, it struck him as a fine and original work.

One of the finest staircases he knew was that of Christ Church, Oxford. A straight flight led to the hall, a few steps taking one to the Cathedral Close, another flight going to a small quadrangle, and then came the kitchen. ᴨ staircases were without number; this was a central flight with branches to the right and left. One of the finest in London was that of Stafford House, where the flights went round three sides of a magnificent hall with columns and corridors. The twin flights, however, had a parasitic look, like vines on an elm, and this was peculiar, as the general fault of such staircases was that all view of the cage above was obscured, so that it was sacrificed at the very moment when it should be most prominent. When magnificence and not economy of space had to be considered, these second flights should be enclosed between walls, with double rows of columns and corridors.

The bridge staircase was to be seen to perfection in the Comédie Française at Paris, and here the lecturer exhibited a drawing of the staircase of the Paris Grand Opera, designed by M. Charles Garnier, adding that the whole of this magnificent building afforded an example of revived Classic, sweetly proportioned and yet distinctly French. Of the oval and circular staircases, a well-known example was that of the Palazzo Barbarini, with a riser of four inches, and a tread of one foot seven and one-half inches. There was also a circular staircase in the building of the Belvedere at the Vatican, the well being formed of eight single columns to each story: Tuscan on the lowest, and then Doric, Ionic, Corinthian and Composite. Sir William Chambers had a semicircular hanging staircase in one of the wings of Somerset House, facing the Strand. This was well worth looking at, and showed how a beautiful plan might produce a bad effect. The worst feature in it was the landing in the middle, making an ugly break in the spiral lines.

Probably one of the most extraordinary compound staircases in existence was that designed by Michael Angelo for the Lorentian Library. It went from the hall to the upper library, and consisted of a central flight on the bevel with fifteen risers, and with a staircase on either side. The steps curved forward like a bent bow with hobs at each end, and we could hardly understand for what purpose these hobs had been made, except for appearance. It was an extremely effective staircase, and quite different from anything he had seen in any part of the world.

Another very splendid compound staircase was that of Buckingham Palace, by John Nash. From the hall a flight of eight steps led to a landing lighted by a screened side window; nineteen steps led to the next landing, well lighted from above, and then four steps and a landing and twenty-two more steps between walls, adorned with columns, led in one line to the gallery-door. Had the exigencies of the building permitted, it would have been better to have had a landing to the gallery-door, lighted from the top, like that in the Royal Academy. The balustrade was very handsome, being of gilt iron-work. At the second landing from the bottom, two curved twin flights led to a landing and balcony over the entrance to the staircase; this part was domed over with a flat dome and pendentions. The central dome was of ground-glass, with slight bars of metal, the central part being in the shape of a star. This beautiful staircase was well worthy of notice: when a lad he had been very much struck with it, and he had admired it again the other day.

He would like also to call attention to the staircase in the Royal Academy. The soffits of the upper stairs were moulded and had a good effect, and rather intensified the lines of the lower stairs. The stairs, which were eight feet above, swelled out as we got to the landing, and were ten feet at the bottom, and came down well between the coupled columns. The flight between the large Devonshire marble columns had the light from above. In the case of the grand staircase at Versailles the visitor came up a straight flight in front, with twin staircases right and left. The first flight was square, with the angles cut off. The staircases were about ten feet wide. The first floor had Ionic pilasters all round the cage.

He must not omit to mention Wilkins's staircase at Trafalgar Square, when the National Gallery and Royal Academy were under one roof. Illustrations of this might be seen in Leed's "*Public Buildings of London.*" The entrance was by a central hall lit by windows at the end; the side walls were kept low, with Corinthian columns on them and a balustrade between, and the stairs to the National Gallery and the Royal Academy were opposite the centre and in two continuous flights, so that when you turned round on reaching the first floor, you could see the persons ascending on the other side. It had a magnificent effect, and it was much to be deplored that it had been pulled down and other commonplace staircases put up in their place merely to save a little room. This might be all very well in the case of private mansions, but was a scandal in the

matter of public buildings. The National Gallery had many splendid points about it, and a great deal of that which was complained of was forced upon Wilkins against his will. He was, amongst other things, compelled to force back the angles so that one end should not interfere with the view of St. Martin's Church.

Mr. Aitchison added that he had a good many photographs of more or less celebrated staircases exhibited on the wall, but it was impossible to name all the fine staircases in the world. Had he done so, the lecture would have been a mere catalogue. He had been compelled to omit all mention of the fine staircases at Genoa, where the whole ground-floor of some of the palaces seem devoted to their display. Then there were the splendid ones in some of the London halls, and those of F. P. Cockerell, one at the Royal Society of Painters in Water-Colors, and one which that architect sketched out, and which he (the lecturer) finished, in South Audley Street. He had been unable to speak of the fine Elizabethan staircases and many of those designed by Inigo Jones.

In conclusion, he would urge that in almost every tolerably-sized house, where the principal rooms were on the first floor, greater attention should be devoted to the staircase than had been paid within the last twenty years. The magnificent examples shown on the walls would not, he hoped, be without some effect on the works his hearers might hereafter execute.

SOME SUGGESTIONS.

To the Editors of the American Architect:—

Dear Sirs,—Your ever more valuable paper contained some time ago an article on "Helps" which doubtless expressed the sentiments of many of your busy readers. In the interests of those who thoroughly appreciate the value of systematic study, I would like to ask a number of favors.

1. That with each volume of the *American Architect* you issue two copies of the index; one copy to be bound with the letter-press, and the second to be preserved with other extras in a patent binder.

2. That the index to illustrations be printed only on one side of the paper, so that the part belonging to the extra copy can be cut up and pasted in the portfolios of classified cuts, and the index by location in the "Excursion Book."

3. That you will furnish for a moderate sum, muslin-covered portfolios (very light) with tapes and blank title card. The portfolios to be not over one and one-half inches spread.

4. That whenever demand will warrant such an experiment, you will issue the *American Architect* in leaflets with only one article on a leaf. The increased bulk would be more than compensated by the increased usefulness, and if it were a special edition issued before the other, the increased expense could be borne by those only who were willing to subscribe to it.

Hoping you will attribute these suggestions to my intense appreciation of your spirit of progress, and thanking you sincerely for the promise of the "Monographs," I remain, etc.,

B. B. B.

[We are glad to receive these suggestions, and will always welcome any hint as to ways in which we can make our journal of more practical usefulness to its readers. While we cannot promise to act on all suggestions sent us we will go as far as we can to meet all that are reasonable and practical. — Eds. American Architect.]

A BOOK ON STEAM HEATING.

New Deaf and Dumb Institute,
Council Bluff, Iowa, April 8, 1885.

To the Editors of the American Architect:—

Dear Sirs,— Will you please tell me where I can get a good book on mechanical and steam-heating engineering.

Yours truly, T. K. Winter.

[Write to John Wiley & Son, for W. J. Baldwin's "*Steam Heating for Buildings or Hints to Steam Users.*" — Eds. American Architect.]

"THE SANITARY NEWS."

Princeton, Ind.

To the Editors of the American Architect:—

Dear Sirs,— Please inform me if there is a paper published at Chicago, Ill., by the name of *Sanitary News*. I believe the editor is Mr. Clark. State the name of office.

Yours respectfully, Thomas Brown.

[The *Sanitary News*, edited by Mr. G. P. Brown, is published at 113 Adams st., Chicago. The subscription is $2 per year. — Eds. American Architect.]

CORRUGATED WIRE-LATH.

New York, April 1, 1885.

To the Editors of the American Architect:—

Dear Sirs,— In a recent issue you mention wire-lath, corrugated to save furring; will you kindly give name of patentee or maker — something by which it can be exactly specified — and gratify

Constant Reader.

[The Stanley Corrugated Fireproof Lathing Company, 239 Broadway, New York, now makes the lathing referred to. — Eds. American Architect.]

NOTES AND CLIPPINGS.

The Cypress of Santa Maria del Tule, Mexico.— Somebody in writing of old trees says some have been found in Africa that are computed to be 5150 years old, and a cypress in Mexico is believed to have reached a still greater age. The cypress of Santa Maria del Tule in the State of Oaxaca is probably the oldest individual of any species on the globe. If estimates of tree ages are to be relied upon, the life of this venerable forest monarch may have spanned the whole period of written history. At last accounts it was still growing, and in 1851, when Humboldt saw it, it measured 42 feet in diameter, 146 in circumference, and 382 feet between the extremities of two opposite branches. — *Boston Journal.*

The Pneumatic Despatch in New York.— The Western Union Telegraph Company, in New York City, are about to substitute pneumatic tubes for the distribution of city messages. Brass tubes three inches in diameter have been laid four feet below the surface. The leather cases for messages are to be impelled by compressed air at one end and with vacuum on the other, at an estimated velocity of about a mile per minute. At the terminal stations are four engines, eighteen inch by thirty-six inch cylinders with compressors or exhausters tandem with the cylinder, developing two hundred and forty horse-power each, at eighteen revolutions per minute. Air is exhausted from one reservoir, and compressed to thirty pounds per square inch in the other. The pumps and connections are so arranged that any of them can be used either for compression or exhaustion to either reservoir. The Company have used short pneumatic tubes to some newspaper offices and to different departments for some time, but the plant now in process of construction will contain many novelties of detail in respect to facilities for sending and receiving messages from branch stations, construction of expansion joints, and convenience of operation. — *Engineering.*

The Irrigation Canals of Northern Italy.— Few of the many travellers in North Italy give heed to the wonderful system of irrigation canals in Piedmont, which yield 125,550 gallons of water per second, distributed over 1,680,400 acres of land, while those of Lombardy yield 95,355 gallons over 1,680,400 acres. The Cavour Canal, constructed within the last few years, draws its supply from the rivers Po and Dora Baltea, and has a flow of 29,200 gallons per second, watering 40,000 acres at a cost of £32,000 per mile, or a total of £1,600,000. Its volume is now to be increased by 5,300 gallons per second. A smaller subsidiary canal gives 18,540 gallons per second, and cost £24,154 per mile. The canals in this district are not only used for irrigation, but also for motive power, by which the water is raised to higher levels. On the steep slope of the Dora Baltea, near Turin, three canals — the Torea, Agliano, and Rothe — flow parallel to each other, though on different levels, the water of all these being used at the top of the hill, 62 feet above the highest of them. A stream of 154 gallons per second is diverted from the Torea Canal, and carried down the hill by a lead pipe, until it meets the Agliano Canal. Here it is pumped up to the summit level by eight pumps, worked by four turbines driven by a fall of water taken from the Agliano, and allowed to fall into the Rothe, by joining which it is available for irrigation. By this means not a drop is wasted. The Italian engineers have gone on the principle of constructing the works on a vast scale, so as to have everything on a uniform arrangement, and avoid constant alterations, and by this means they have succeeded in utilizing every drop of water, and making North Italy a marvel of fertility.—*The Builder.*

Another Ingenious Swindle.— One of the most expert speculators in Vienna is a man named Heinrich Kuffler. Over there, however, they with brutal frankness, call such men swindlers. Some of his late tricks are so good that even Jay Gould might take lessons from him. The Austrian speculator is fully up to Mr. Ward, on a smaller scale, however. Not long since, Kuffler appeared in the office of a wealthy lumber-dealer who owned an immense lumber-yard in the heart of the city. At this time there was a perfect mania for building houses in Vienna, and available lots commanded fancy prices. "I want to buy the land you have got your lumber-yard on. I want to put up a big hotel on it," said Kuffler. "I don't care to sell." "But I have got to have it. It is the only suitable place in this part of the city. I'll give you half a million." "I don't want to sell. I would not sell for a million." "I will give you a million." The lot was not worth a million, but as the merchant had his lumber on it, and was wealthy, he did not care to accept the offer. "No, I would rather not." "I'll give you a million and a quarter, and to show you that I am in earnest, I'll put up fifty thousand marks forfeit. I must have a big lot on which to put up my new hotel," said he, placing that amount in thousand-mark notes on the table. The poor lumber-dealer became nervous and excited. Great beads of perspiration stood on his brow. He asked for twenty-four hours to think about it. The trade was then concluded. The lumber was to be cleared away before two months. The fifty thousand marks forfeit were to be paid over at the end of a week. The lumber-dealer was satisfied on that point. He knew Kuffler had the money. The lumber-man then proceeded to hunt for another lumber-yard. Suitable vacant lots were extremely scarce. A land-agent, however, who had heard that the lumber-dealer was looking for a lot, offered him one for six hundred thousand marks, but only gave him the refusal of it for twenty-four hours. He said he could get that amount from another party. In his anxiety to sell the place to Kuffler for a million and a quarter, the lumber-merchant paid down six hundred thousand francs to the agent. Next day Kuffler notified the lumber-dealer that he would pay over the fifty thousand marks forfeit, as he was unable to raise the million and a quarter, the purchase money for his lot. With the aid of a skilful agent, the speculator had sold to the lumber-merchant for six hundred thousand marks a lot only worth four hundred thousand marks, thereby profiting, after paying the fifty thousand marks forfeit, a cool 150,000 marks. The lumber-merchant has now two lots on his hands, and is also in possession of considerable experience. — *Siftings.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

315,467. WATER-CLOSET. — Louis and John Brandt, New York, N. Y.
315,471. ROOF-PAINT COMPOSITION. — Daniel Brobst, Portland, Mich.
315,474. SASH-HOLDER. — Frederick H. Bultmann, Cleveland, O.
315,487. COMPOSITION MASTIC FOR COVERING ROOFS, TELEGRAPH-WIRES AND THE LIKE. — Andrew Derrom, Paterson, N. J.
315,522. VENTILATOR. — Charles B. Loveless, Worthington, Minn.
315,533. SASH-BALANCE. — Thomas Morton, New York, N. Y.
315,545. DRAWING-BOARD AND T-SQUARE. — Clifford H. Prescott, Lawrence, Mass.
315,557. ARTIFICIAL FLAG-STONE. — Augustus S. Sampson and Daniel G. Peck, Minneapolis, Minn.
315,580. SHUTTER. — Horatio O. Whyman, Norfolk, Neb.
315,584. ROOFING COMPOSITION OF TAR, CEMENT, ETC. — Kari Wildhagen, Treseburg, Brunswick, Germany.
315,608. STONE-SAWING MACHINE. — John H. Frenier, Rutland, Vt.
315,617-618. FOLDING CHAIR OR SETTEE. — Herbert J. Harwood, Littleton, Mass.
315,621. ADJUSTABLE STOP FOR CALIPERS. — Irving L. Holmes, Providence, R. I.
315,634. ELEVATOR. — David Kennedy, Detroit, Mich.
315,641. BURGLAR-ALARM. — John H. Luebsen, St. Louis, Mo.
315,652. COCK FOR HOUSE SERVICE AND STREET-WASHER CONNECTIONS. — John Moss, Brooklyn, N. Y.
315,657. DOOR-LOCK. — Floyd N. Perkins, Bellefontaine, O.
315,663. SAW. — Christopher Richardson, Newark, N. J.
315,679. LIGHTNING-CONDUCTOR. — Francis R. Upton, Orange, N. J.
315,681. SHUTTER-BOLT. — John Von Hollen, Charleston, S. C.
315,711. MANUFACTURE OF HYDRAULIC CEMENT. Robert Bryce, Louisville, Ky.
315,718. DOOR-CHECK. — Jas. W. Callaway, Temple, Tex.
315,720. SCAFFOLD-IRON. — Andrew H. Campbell, Philadelphia, Pa.
315,722. SHINGLE AND SIDING GUAGE. — William H. H. Campbell, Wichita, Kans.
315,726. EXTENSION-TRESTLE. — Henry H. Childers, Louisville, Ky.
315,734. SAFETY-ATTACHMENT FOR ELEVATOR-CARS. — Philip Cohn, Nuevo, Laredo, Mexico.
315,748. BOLT. — Jas. J. Devine, Philadelphia, Pa.
315,761. SLIDING-DOOR LOCK. — William Gerwien, Chicago, Ill.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report thirty-five permits have been granted, the more important of which are the following: —

U. S. Firor, 3 two-st'y brick buildings (square), w s Wilmer Alley, n of Smith St.

Geo. W. Donahue, 16 two-st'y brick buildings, n s Preston St., w of Belair Ave.; and 7 two-st'y brick buildings, w s Belair Ave., commencing n w cor. Preston St.

Thos. H. Blick, 7 two-st'y brick buildings, e s Holbrook St., s of Hoffman St.

Patrick Hibbitts, three-st'y brick building, s s Baltimore St., between Carey St. and Carrollton Ave.

L. P. Haslup, four-st'y brick factory, 30' x 33', w s Norris Alley, n of Baltimore St.

Cass & Bros., four-st'y brick building, s s Baltimore St., between Paca and Greene Sts.

J. T. Fahey, 6 two-st'y brick buildings, e s Fulton St., n of McHenry St.

Frederick Burger, 12 two-st'y brick buildings, e s Falls Alley, between Federal and Lanvale Sts.; and 4 three-st'y and 6 two-st'y brick buildings, w s Barclay St., between Federal and Lanvale Sts.

Jesse F. Ely, three-st'y brick building, w s Richmond St., between Tyson and Howard Sts.

Francis McCann, 6 two-st'y brick buildings, w s Rose St., s of Eastern Ave.

E. J. Cromer, 5 two-st'y brick buildings, e s Valley St., n of Preston St.

Jos. Matthews, three-st'y brick building, e s Front St., between Fayette and Low Sts.

F. Portugal, three-st'y brick building, n s Bank St., between Washington and Chapel Sts.

Jas. Doyle, 2 three-st'y brick buildings, w s Jasper St., n of New St.

Frederick Hertel, 5 two-st'y brick buildings, commencing n e cor. Eagle St. and Addison Alley, fronting on Eagle St.

Boston.

BUILDING PERMITS. — *Brick.* — *West Newton St.*, near St. Botolph St., 2 dwells., 21' 6" and 25' x 47'; owner, L. M. Thompson; builder, Thomas R. White.

West Newton St., cor. St. Botolph St., 2 dwells., 21' 6" and 22' x 47'; owner, G. M. Gibson; builder, Thomas R. White.

Wood. — *Norfolk St.*, near Elizabeth St., poultry-house, 10' x 20'; owner and builder, N. E. Hallace.

Bodwell St., near Bird St., dwell., 28' x 32' 6"; owner and builder, E. McKentnie.

C St., cor. Tudor St., dwell. and bakery, 23' x 39'; owner, John Arroll; builder, P. F. Hanlon.

Paris St., *No.* 256, dwell., 21' x 36'; owner, Michael Powers; builder, J. C. Frame.

Carlton St., near Mt. Vernon St., boat-house, 15' x 25'; owner, Moseley Hines; builder, J. G. Scott.

Clifton St., near Batchelder St., dwell., 20' and 36' x 37' and 38'; owner and builder, J. Breckenridge.

Walnut Ave., *No.* 354, cor. Homestead St., dwell., 26' x 35' 8"; owner, G. H. Williams; builder, Watson Bowers.

Dorchester Ave., *No.* 317, dwell., 24' x 35'; owner and builder, Wm. Peard.

Summit Ave., near Allston St., dwell., 19' x 28'; owner, Patrick Hassett; builder, Richard Ryan.

East Ninth St., near H St., stable, 25' x 25'; owner, W. H. Hart; builders, Holbrook & Harlow.

Dorchester Ave., opposite Greenwich Pl., store and shed, 20' x 30'; owner, John F. Baker; builder, J. H. Wilder.

Dorchester Ave., opposite Greenwich Pl., mechanical, 20' x 30'; owner and builder, same as last.

Allston St., near Melville Ave., workshop, 18' x 25'; owner and builder, J. H. Vinal.

Brooklyn.

BUILDING PERMITS. — *Rutledge St.*, s s, 100' w Wythe Ave., 2 one-st'y brick valve house and boiler-house, slate roofs; cost, each, $1,200; also, gas-holder tank, cost, $65,000; owner and architect, Nassau Gas-Light Co., Kent Ave. and Cross St.; builder, John McNamee.

Clason Ave., w s, 80' s Putnam Ave., four-st'y brown-stone tenement, tin roof; cost, $12,000; owner, Alfred Churchman, 66 Putnam Ave.; architect, Amzi Hill.

Duryea St., s s, 125' e Broadway, 4 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $3,800; owners, Joseph Collins and J. Duneday, 66 Woodbine St.; architect, I. D. Reynolds; builder, R. Healey.

Ivy St., n s, 150' e Bushwick Ave., 4 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $3,500; owner and architect, James C. Brower, 10 Ralph Ave.

Jefferson St., n s, 150' w Central Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,500; owner and builder, C. Dehler, Jefferson St., near Evergreen Ave.; architect, J. Platte.

Evergreen Ave., e s, 25' n Palmetto St., 3 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $2,000; owner, John F. Ehlers, 310 Stockton St.; architect and builder, W. M. Whitenack.

Tompkins Ave., *No.* 67, three-st'y frame (brick-filled) tenement, tin roof; cost, $3,500; owner, Mrs. Marie Kaiser, 123 Floyd St.; architect, Frank Holmberg; builder, George Loeffler.

Powers St., *No.* 115, n s, 125' w Ewen St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,470; owner, Matilda J. Meehan, 200 Ainslie St.; builder, G. H. Garrison.

Dean St., s s, 230' e Brooklyn Ave., two-st'y brick dwell., tin roof; cost, $4,500; owner and builder, Arthur G. Stone, 301 Jefferson St.; architect, G. A. Schellenger.

Hancock St., s e, 165' 8" w Marcy Ave., 2 three-st'y brick dwells., tin roofs; cost, each, $9,500; owner and builder, G. H. Stone, 301 Jefferson St.; architect, G. A. Schellenger.

Decatur St., s s, 100' w Reid Ave., 5 two-st'y brick dwells., tin roofs, wooden cornices; cost, each, $3,000; owner, etc., John S. J. King, 1368 Pacific St.

St. Mark's Ave., s w cor. Carlton Ave., three-st'y brown-stone dwell., tin roof; cost, $7,500; owner, etc., John Donovan, 122 St. Marks Ave.

Calyer St., n s, 75' e Manhattan Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $5,000; owner, Leonhard Burgey, 184 Green St.; architect, H. Vollweiler.

Ellery St., *No.* 193, n s, three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner, Maria Ziehn, 193 Ellery St.; architect, H. Vollweiler.

Freeman St., n s, 250' e Oakland St., three-st'y frame (brick-filled) tenement, gravel and cement roof; cost, $4,200; owner, E. Butler, Freeman St.; architect, James Mulhaul; builders, James Doig, Jr., and Gately & Smith.

Woodbine St., *No.* 74, s s, 275' e Bushwick Ave., three-st'y frame (brick-filled) dwell., tin roof; cost, $3,200; owner and architect, John B. Wear, 72 Woodbine St.; contractor, R. Right; mason, not selected.

Washington Ave., *No.* 219, e s, 108' n Willoughby Ave., three-st'y Portland stone dwell., tin roof; owner, J. Henning Smith, 221 Washington Ave.; architect, Edward C. Smith; builders, Squire & Whipple and Mead & Taft.

Quincy St., s s, 225' w Marcy Ave., 3 two-st'y brown-stone dwells., tin roofs; cost, each, $4,200; owner, James Kerr, 298 Quincy St.; architect, Fred. D. Vrooman; builder, Wm. Vrooman.

Fourth St., *No.* 269, w s, 50' s North Tenth St., four-st'y frame (brick-filled) tenement, tin roof; cost, $6,400; owner, Ellen V. Lawrence, 267 Fourth St.; architect, E. F. Gaylor; builder, John Fallon.

Chicago.

BUILDING PERMITS. — J. Byrne, three-st'y store and dwell., 199 West Twelfth St.; cost, $4,000.

M. J. Livingston, three-st'y store and dwell., 122 Third Ave.; cost, $8,000.

M. Kondzorsky, two-st'y dwell., 657 Dixon St.; cost, $3,000; builder, A. W. Rudnick.

P. Benz, two-st'y dwell., 265 Irving Pl.; cost, $3,000; architect, T. Karls; builders, Kreig & Demuth.

E. B. Sheldon, 4 three-st'y dwells., 52 to 58 St. Clair St.; cost, $15,000.

J. Bordman, three-st'y store and dwell., 2711 Wentworth Ave.; cost, $4,500; architect, J. P. Doerr.

J. F. Mendson, 2 four-st'y stores and dwells., 236 and 238 Halsted St.; cost, $15,000.

D. Marks, 2 three-st'y dwells., 182 and 184 Twenty-fourth St.; cost, $6,500; architect, H. Van Pelt; builders, Gorman & Ethier.

H. P. Nelson, two-st'y dwell., 552 West Superior St.; cost, $2,500; builder, C. Olson.

Framke & Sievers, three-st'y factory, 394 to 398 Hastings St.; cost, $5,000; architect, Wm. Strippelman; builder, Dressel.

J. H. Hull, two-st'y dwell., 789 West Monroe St.; cost, $4,500.

E. L. Smith, three-st'y store and flats, 285 Division St.; cost, $7,000; architect, W. Strippelman; builder, F. Mehls.

J. W. Odell, three-st'y dwell., 560 and 562 Dearborn Ave.; cost, $20,000; architects, Treat & Foltz.

E. W. Kubitz, three-st'y store and flats, 787 Milwaukee Ave.; cost, $4,000; architect, H. Kley.

L. B. Otis, three-st'y store, 195 and 197 Laselle St.; cost, $20,000; architect, J. V. Wadskier.

R. King, two-st'y addition, 224 and 226 North Union St.; cost, $8,000; architects, Furst & Rudolph.

F. Kruska, three-st'y dwell., 822 Ashland Ave.; cost, $3,500.

F. H. Concal, three-st'y dwell., 445 West Nineteenth St.; cost, $3,500.

J. Konopasek, three-st'y dwell., 298 Twentieth St.; cost, $3,200.

C. Warner, three-st'y store and dwell., 74 Twenty-fifth St.; cost, $8,000.

New York.

RECTORY. — On the n e cor. of Madison Ave. and Sixtieth St., a rectory for the "Church of the Holy Spirit" is to be built from designs of Mr. R. H. Robertson.

STORES. — For Messrs. L. Sachs & Bro., a five-st'y brick warehouse, iron front, 25' x 100', is to be built at No. 26 West Houston St., at a cost of $30,000, from designs of Mr. Richard Berger.

WAREHOUSE. — On the w s of Water St., between Catherine and Market Sts., a three-st'y brick warehouse, 60' x 11', is to be built for Mr. C. Garrick, from plans of Mr. J. H. Valentine.

FLATS. — For Mr. John D. Karst, 2 five-st'y brick, stone and terra-cotta flats and stores, 25' x 78' 6", are to be built at Nos. 1872 and 1874 Third Ave., from designs of Richard Berger, at a cost of about $34,000.

For Daniel Tier, 3 five-st'y brick and brown-stone flats are to be built, on the s e cor. of Second Ave. and First St., at a cost of $65,000, from plans of Mr. M. L. Ungrich.

On the s s of Forty-fourth St., between Second and Third Aves., a five-st'y brown-stone flat, 18' x 76', is to be built for Miss Mary Taylor, from plans of Messrs. A. B. Ogden & Son.

For Mrs. Davis, a four-st'y brick and terra-cotta flat and store, 18' x 40', is to be built on the n w cor. of One Hundred and Twenty-sixth St. and Lexington Ave., from plans of Mr. R. Rosenstock.

BUILDING PERMITS. — *Beach St.*, *Nos.* 53 *and* 55, six-st'y brick factory, gravel roof; cost, $25,000; owner and builder, Joseph Naylor, 107 Duane St.; architect, Oscar S. Teale.

Leroy St., *No.* 19, four-st'y brick stable, tin roof; cost, $12,000; owner, John P. Nichols, 92 Charles St.; architect, John McIntyre; builder, John F. Moore.

Mulberry St., *No.* 42, four-st'y brick tenement, tin roof; cost, $10,000; owner, C. L. Wolfe, by James M. Jackson, Agent, 3 Mercer St., architect, Fred. Jenth.

West Tenth St., *No.* 148, five-st'y brick tenement, tin roof; cost, $18,000; owner, Chas. Guntzer, 22 East Third St.; architect, Wm. Graul.

East Third St., *Nos.* 302 *and* 304, 2 five-st'y brick tenements and stores, tin roofs; cost, $12,000 and $16,000; owner, Estate A. B. Schermerhorn, Wm. C. Cruikshank, Agent, 111 East Sixty-first St.; architect, Geo. B. Post.

West Sixteenth St., *Nos.* 409 *and* 411, 2 five-st'y brick tenements, tin roofs; cost, each, $14,500; owner, Philip Malone, 248 West Twenty-second St.; architect, James Stroud; builders, Gillespie & Harlow and J. V. and S. J. Donvan.

West Fiftieth St., *No.* 530, five-st'y brick tenement, tin roof; cost, $9,000; owner, Wm. Ailewelt, on premises; architect, Chas. Neumeyer.

West Fiftieth St., *No.* 410, five-st'y brick tenement, tin roof; cost, $7,000; owner, Martin Karl, 406 West Fiftieth Sts.; architects, Thom & Wilson; builder, G. A. Zimmerman.

First Ave., *No.* 972, five-st'y brick tenement and store, tin roof; cost, $10,000; owner, Bernard G. Wenning, 970 First Ave.; architects, A. B. Ogden & Son.

Seventh Ave., e s, 23' 6" s Thirty-second St., five-st'y brick tenement, tin roof; cost, $18,500; owner, James J. Morrison, 19 West Thirty-seventh St.; architects, Thom & Wilson; builders, Jacob Vix & Son.

Pier, foot of Twenty-sixth St., East River, two-st'y frame reception-room, tin roof; cost, $20,000; owner, City of New York, Commissioners Charity and Correction, 66 Third Ave.; architect, N. Le Brun.

Thirtieth St., n s, 275' e Tenth Ave., 4 five-st'y brown-stone front tenements, tin roofs; cost, each, $8,000; owner, Peter M. Ramsey, Jersey City; architect, J. C. Burne; builder, not selected.

West Thirty-eighth St., *No.* 321, four-st'y brick tenement, tin roof; cost, $12,000; owner, John D. Hassinger, 319 West Thirty-eighth St.; architect, M. Louis Ungrich.

First Ave., n w cor. Forty-fourth St., three-st'y brick stable and storage-building, gravel roof; cost, $6,500; owner, Patrick Kiernan, President D. Jones Co., on premises; architect, Jos. M. Dunn; builder, Jas. O'Toole.

Seventy-first St., n s, 200' w First Ave., 5 five-st'y brick tenements, tin roofs; cost, each, $15,000; owner, Jennie S. McDonald, 1532 Park Ave.

Eighty-third St., n s, 110' w Third Ave., five-st'y brown-stone front tenement, tin roof; cost, $12,000; owner, B. C. Wandell, 159 East Eighty-third St.; architect, D. J. Macrae.

East Eighty-sixth St., *Nos.* 163 *and* 165, 2 five-st'y brick tenements, tin roofs; cost, each, $23,000; owner, Dr. Valentine Pressler, 105 East Sixtieth St.; architects, Schwarzmann & Buchman; builders, List & Lennon and John F. Moore.

Seventy-second St., n s, 175' w Ninth Avenue, 5

four-st'y brown-stone front dwells., tin roofs; cost, each, $22,000; owner, Chas. Batchelor, 247 West One Hundred and Twenty-fifth St.; architect, M. V. B. Ferdon; builder, not selected.

One Hundred and Fourth St., s s, 21′ 5″ e Boulevard, 7 three-st'y brown-stone front dwells., tin roofs; cost, each, $12,500; owner, Martha A. Lawson, 524 West Forty-ninth St.; architect, M. L. Ungrich.

One Hundred and Fifth St., s s, 280′ e Grand Boulevard, 4 three-st'y brown-stone front dwells., tin roofs; cost, each, $12,000; owner, architect and builder, John F. Moore, 427 West Fiftieth St.

Seventieth St., s s, 175′ e Eleventh Ave., 3 three-st'y brown-stone front dwells., tin roofs; cost, each, $12,000; owners, Treacy & Van Loon, 242 East Thirty-third St.; architect, J. H. Valentine.

Eighty-first St., n s, 250′ e Ninth Ave., four-st'y brown-stone front dwells., slate and tin roofs; cost, $40,000; owner, Christian Blinn, 400 West Seventy-ninth St.; architect, A. B. Jennings.

One Hundred and Nineteenth St., s s, 65′ e Sixth Ave., two-st'y brown-stone front stable; cost included in last; owner and architect, same as last.

One Hundred and Fifty-fifth St., n s, 350′ w Courtlandt Ave., three-st'y brick dwell., tin roof; cost, $7,000; owner, Mrs. Hannah Wills, 1621 First Ave.; architect, Henry Dudley; builders, Henry Chenoweth and W. Volentine.

Philadelphia.

BUILDING PERMITS. — *Twelfth St.*, above Huntingdon St., 25 two-st'y dwells., 14′ x 29′; Thornton & Harper, contractors.

North Centre St., *No.* 3729, 3 two-st'y dwells., 13′ x 25′; Thos. Badman, contractor.

Paul St., n e cor. Meadow St., addition to boiler house, 30′ x 40′; A. Hamilton, contractor.

Carnavan St., above Tasker St., 2 two-st'y dwells., 14′ x 37′; Saml. Young, contractor.

Pennock St., below Brown St., 5 two-st'y dwells., 14′ x 34′; Wm. Charlton, owner.

Thirty-second St., above Spring Garden St., 6 three-st'y dwells., 17′ x 55′; J. H. McIlvain, owner.

Thompson St., above Huntingdon St., 2 three-st'y stores, 20′ x 38′; A. McClay, contractor.

Alamendo St., above Somersett St., three-st'y dwell., 20′ x 31′; A. McClay, contractor.

Main St., *No.* 4609, shop, 18′ x 32′; J. D. Caldwell, contractor.

Catharine St., e of Fifteenth St., three-st'y dwell., 18′ x 62′; J. McVicar, contractor.

Twenty-fifth St., above Master St., three-st'y store and dwell., 16′ x 41′; J. C. Ruff, contractor.

Wood St., *No.* 1901, three-st'y store and dwell., 38′ x 42′; Pennock Bros., contractors.

Sixteenth St., below Tioga St., two-st'y dwell., 16′ x 40′; J. L. Tomlinson, contractor.

Sommerville St., and Somersett St., two-st'y dwell., 14′ x 48′; J. L. Tomlinson, contractor.

Merion Ave., w of Forty-fifth St., three-st'y dwell., 16′ x 40′; Thos. Burroughs, contractor.

South Nineteenth St., *Nos.* 1514 and 1516, 2 two-st'y dwells., 16′ x 39′; Saml. Clellar, contractor.

Seventh St., and Montgomery Ave., church, 66′ x 77′; Martin Helzel, contractor.

Lansom St., above Tenth St., 2 six-st'y buildings, 45′ x 86′; Geo. F. Payne & Co., contractor.

Marsden St., Tacony, 3 two-st'y dwells., 14′ x 28′; W. H. Greenfield.

Broad St., below Washington Ave., addition to warehouse, 20′ x 40′; Herbach & Auchter, contractors.

St. Louis.

BUILDING PERMITS. — Ninety-one permits have been issued since our last report, sixteen of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —

A. Cochran, two-st'y frame dwell.; cost, $3,000; J. H. Havens, contractors.

Mrs. B. C. Taylor, three-st'y frame dwell.; cost, $4,000; J. Strimple & Son, contractors.

Union Depot R. R. Co., one-st'y car shed; cost, $2,800; Helm Bros., contractors.

Thos. J. Furlong, 4 adjacent two-st'y brick dwells.; cost, $10,000; Thos. Furlong, architect; sublet.

J. Merton, two-st'y brick dwell.; cost, $3,325; J. S. Kuhnert, contractor.

R. Mueller, two-st'y brick dwell.; cost, $6,000; P. Ratz, contractor.

Plutner, two-st'y brick dwell.; cost, $3,506; Chas. May, architect, Schildmann & Grosse, contractors.

B. J. Goesse, one-st'y brick skating rink; cost, $2,500; B. J. Goesse, contractor.

G. Bolm, two-st'y brick dwell.; cost, $3,000; E. Jungerfeld & Co., architect, S. H. Schaffner, contractor.

W. Sievers, 2 adjacent two-st'y brick dwells.; cost, $4,000; J. Cairns, architect, W. S. O'Brien, contractor.

J. Hüffner, two-st'y brick dwell.; cost, $3,000; H. Schuermann, contractor.

B. M. Proetz, 2 two-st'y brick dwells.; cost, $6,400; B. M. Proetz, contractor.

W. C. Vasques, 2 adjacent two-st'y brick dwells.; cost, $4,100; J. Conlon, architect; A. Whrl, contractor.

Bids and Contracts.

WASHINGTON, D. C. — List of proposals received and opened April 13, 1885, at 2 P. M., by Gen. M. C. Meigs, Supervising Engineer and Architect, for furnishing materials and labor, in laying wooden flooring in first and second story office-rooms of new Pension Building, Judiciary Square: —

I. W. Gartrell & Bond, Washington, D. C., $8,500.

Smith & Smithson, $6,779, thirty working days.

Langley & Gettinger, Washington, D. C., $7,773; thirty working days.

S. H. Morison, Camden, N. J., $7,300; thirty days.

W. Price & Sons, Washington, D. C., $8,400; thirty days.

C. V. Trott, Washington, D. C., $8,047; forty days.

C. Thomas, Washington, D. C., $7,750; thirty days.

Alex. Duehay, Washington, D. C., $8,950; twenty days.

C. F. Adams, Washington, D. C., $9,450; thirty days.

Wood & Angus, Washington, D. C., $9,985; sixty days.

Z. Downing, Washington, D. C., $9,797; twenty days.

C. R. Monroe, Washington, D. C., $5,400; twenty-one days (*accepted*).

D. J. McCarty, Washington, D. C., $6,990; forty-two days.

Frank Baldwin, Washington, D. C., $9,400; thirty week days.

A. G. Pumphrey, Washington, D. C., $10,500; forty days.

Thomas J. King, Washington, D. C., $8,483; thirty days.

Maxley Anderson, Washington, D. C., $8,440; thirty days.

COMPETITIONS.

CITY-HALL.

[At Richmond, Va.]

February 16, 1885.

Proposals are invited **until June 1st, 1885**, for furnishing designs for a city-hall upon which premiums will be paid as follows: —

For first best design, $700.

For second best design, $300.

The Committee on Grounds and Buildings of the City Council reserves the right to reject any and all designs.

For information address the undersigned.

487 W. E. CUTSHAW, City Engineer.

STATE-HOUSE.

[At Denver, Col.]

STATE OF COLORADO,
OFFICE OF THE BOARD OF CAPITOL MANAGERS,
DENVER, April 16, 1885.

In pursuance of an Act of the Fifth General Assembly of the State of Colorado, entitled "An Act to provide for the erection of a State Capitol Building at the City of Denver, and creating a Board of Management and Supervision, and appropriating funds therefor," plans and specifications for a Capitol building which, when erected, shall not cost to exceed one million of dollars, will be received by the Board of Managers **until 12 o'clock meridian, on the tenth day of July, 1885.**

The said Capitol building will be erected upon the summit of a plat of ground in the city of Denver, State of Colorado, known as Capitol Hill, with its principal façade to the west. The length of said building to be about 300′, and no plans will be considered for a building that are over 310′ in length. The breadth, height and general form must be in such proportion to its length as to constitute a symmetrical building, and must be constructed with special regard to strength and durability. The facing and ornamentation of the superstructure, including cornices, pediments and ballustrades, will be of stone.

Drawings must consist of foundation, sub-basement, basement, or first, second or third story plans, roof plans, and section of same, longitudinal section, transverse section, front, rear and end elevations, dome plan, giving section of same and material used, and method of construction from base to summit. Also giving diameter or area of base, style of architecture and extreme elevation.

The said Capitol building shall be built of stone, brick and iron, as far as practicable, and of material found in the State of Colorado, provided the same can be found in said State as cheaply as other materials of like quality in other localities. The entire building must be made as nearly as possible fireproof. The laws of acoustics must be carefully observed. The materials used in said building must be of the best quality. Provision must be made for steam-heating apparatus, and for the drainage, lighting and ventilation of said building in the most approved manner; and such a number of fireproof vaults as may be necessary for the preservation of the books and papers of the various departments of the State Government; also for elevators, water closets, etc.

All plans and scale drawings must be put on wooden frames or stretchers in order that they may be convenient for examination, and on a scale of one-eighth of an inch to one foot.

Compensation for plans and specifications will be as follows: For the best set of plans and specifications the sum of $1,500; for the second, $1,000; for the third, the sum of $800. All plans and specifications for which money is paid shall become the property of the State. The architect whose plans are adopted will be required to furnish the same in duplicate. For the detailed working plans and supervision, the amount shall not exceed two and one-half per cent of the cost of said building. No plan will be adopted until it shall be definitely ascertained that the entire cost of said Capitol building shall not exceed the sum of $1,000,000.

Said building must contain the following rooms, and such other rooms as convenience and symmetry require:

The sub-basement shall be eight feet between joists, and adapted to the use of the machinery, etc., of the building.

The basement story to be not less than fourteen feet between joists, and extend twelve feet above the surface of the surrounding ground. Said basement story to be divided into rooms to be used for the Adjutant-General's quarters, Historical Society, Horticultural Society, State Geologist and Mineral Cabinet, Commissioner and Inspector of Mines, and Storage Rooms.

First, or principal office story, to be not less than twenty feet between joists, and to contain, as near as practicable, the following rooms, to wit:

Three rooms for the Governor.

Same for Secretary of State.

Three rooms for Auditor of State.

Same for State Treasurer.

Two rooms for Insurance Department, two rooms for Attorney-General, three rooms for State Engineer, three rooms for Railroad Commissioner.

Four rooms for State Board of Land Commissioners, three rooms for Superintendent of Public Instruction.

Second, or double story, to be not less than forty-two feet between joists. The Senate Chamber, Hall of House of Representatives, Supreme Court Room and State Library to be of full height, other rooms to be approximately half of said height.

One Senate Chamber, with lobbies and galleries of appropriate dimensions, to accomodate fifty Senators; one room for Lieutenant-Governor and President, one room for Secretary of Senate, one Post-office, one Stationery and Bill room, one Sergeant-at-Arms room, cloak room, lavatory and closets; two rooms for Engrossing Committee, two rooms for Enrolling Committee, and not less than ten other appropriate committee rooms for use of Senate.

One hall for House of Representatives, with lobbies and galleries of appropriate dimensions, to accomodate one hundred members; one room for Speaker of the House, one room for Chief Clerk of House, one Post-office, one Stationery and Bill room, one Sergeant-at-Arms room, cloak room, lavatory and closets, two rooms for Engrossing Committee, two rooms for Enrolling Committee, and not less than ten other appropriate committee rooms for the use of House of Representatives.

One State library room, one Librarian's room, and ten committee rooms.

One Supreme Court room, one law library room, one Clerk of Court room, one Marshal of Court room, one consultation room, six judges' private rooms, with fireproof vaults, lavatory and closets attatched.

Public lavatory and closets on each floor of said building.

The drawings must be sent to the "Board of Capitol Managers," Denver, Colorado, and be endorsed "Plans for State Capitol Building," and must come under a *nom de plume*, the real name and address to be sent to the Board of Managers in a sealed envelope, marked "private," which will not be opened until after the award is made.

The Board reserves the right to reject any and all plans.

For further information apply to

BOARD OF CAPITOL MANAGERS.

GEO. T. CLARK,
Secretary. P. O. Box, 2291.

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PROPOSALS.

EXTENSION OF TIME.

NOTICE TO BIDDERS.

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., April 21, 1885.

Bidders are hereby notified that the time for opening the bids for the masonry of the basement and superstructure of the post-office, etc., building at Brooklyn, N. Y., is extended **until 2 o'clock, P. M., April 30th, 1885.** M. E. BELL,

487 Supervising Architect.

JAIL AND HOUSE OF CORRECTION.

[At Springfield, Mass.]

OFFICE OF THE COMMISSIONERS OF
THE COUNTY OF HAMPDEN,
STATE OF MASSACHUSETTS.

Sealed proposals for the erection and completion of a jail and house of correction for the County of Hampden, to be located on York Street, in the city of Springfield, Massachusetts, will be received by the undersigned, Commissioners of said County, at their office, **until Tuesday, May 12, 1885.**

Plans and specifications can be seen at the office of D. H. & A. B. Tower, Architects, at Holyoke, Mass., on and after Thursday, April 16, 1885.

The builders to whom the contract shall be awarded will be required to enter into bonds, with at least two approved sureties, for the sum of $35,000, for the faithful performance of the contract.

Bidders will be required to send certified check for the sum of $500 with proposals.

Work to be commenced within 20 days of awarding of contract, and to be finished on or before the 15th day of November, 1886.

The right reserved to the Commissioners to reject any or all bids.

LEONARD CLARK,
HENRY A. CHASE, Commissioners of the County of Hampden.
488 L. F. ROOT,

STEAM-HEATING, PLUMBING, WATER-WORKS AND TUNNELS.

[At Logansport, Evansville, and Richmond, Ind.]

Sealed proposals will be received at the office of the Governor of Indiana, **between the hours of 10 and 11 o'clock, A. M., Saturday, May 30, 1885**, for the following classes of equipments for the Northern, Southern and Eastern Indiana Hospitals for Insane, located respectively at Logansport, Evansville, and Richmond: —

Class 1. For each hospital, four steam generators, one hundred horse-power each.

Class 2. For each hospital, steam-heating apparatus, fifteen thousand to twenty-two thousand square feet of radiating surface.

Class 3. For each hospital, sanitary fixtures and plumbing.

Class 4. For each hospital, pumping-engines.

Class 5. For each hospital, water-supply system.

Class 6. For the Northern Hospital, system of pipe-tunnels.

Specifications (and drawings, where required) of the above work may be seen at the office of E. H. Ketcham, Architect, at Indianapolis, and additional information may be had of Dr. Jos. G. Rogers, Medical Engineer, at Logansport, on and after April 24, 1885.

Separate bids will be required for each class of work, for each hospital, and each bid must be accompanied by a guaranty bond, with two or more resident freeholder sureties, in five per cent of the amount of the bid.

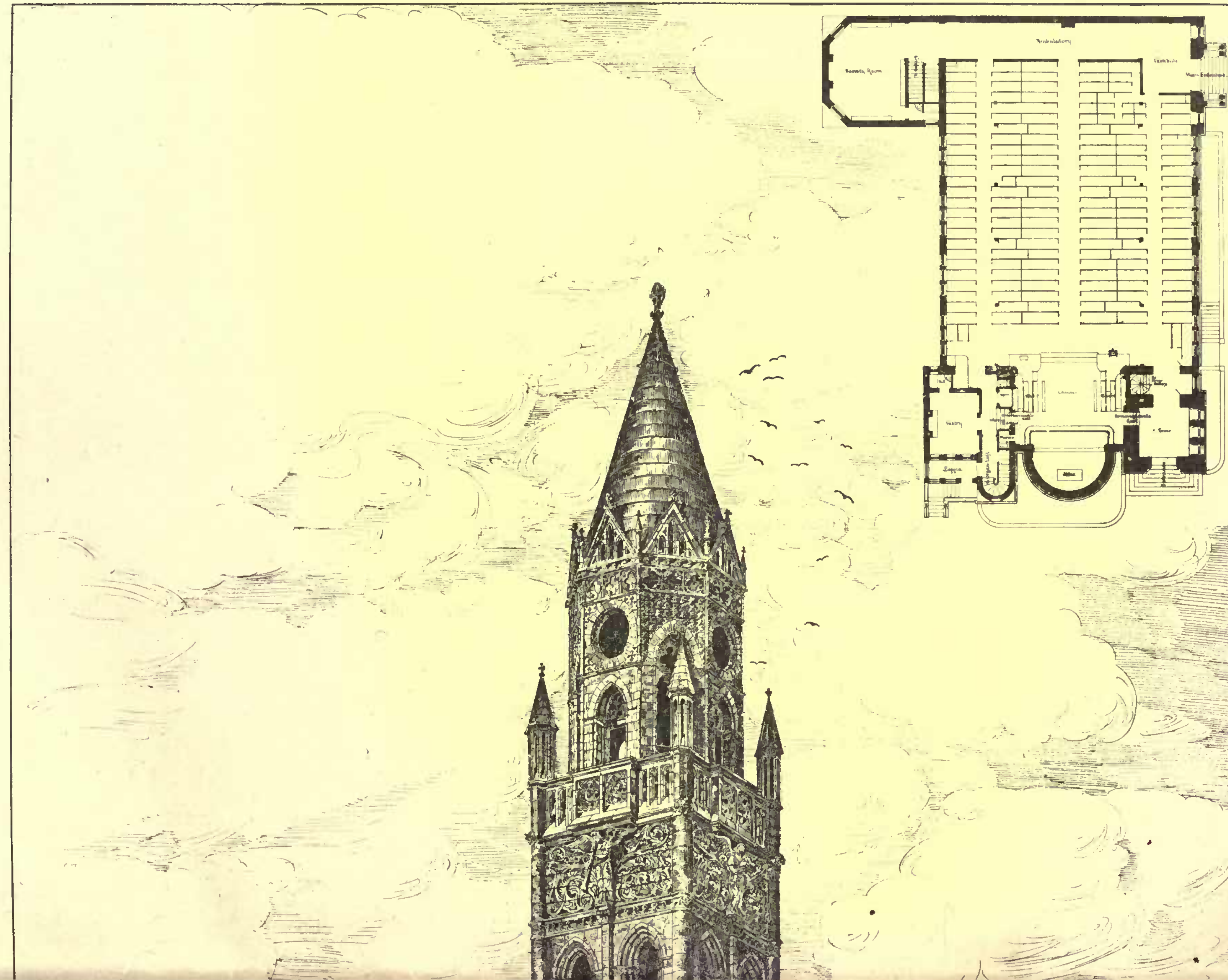
The Board of Commissioners for the Additional Hospitals for Insane reserves the right to reject any or all bids.

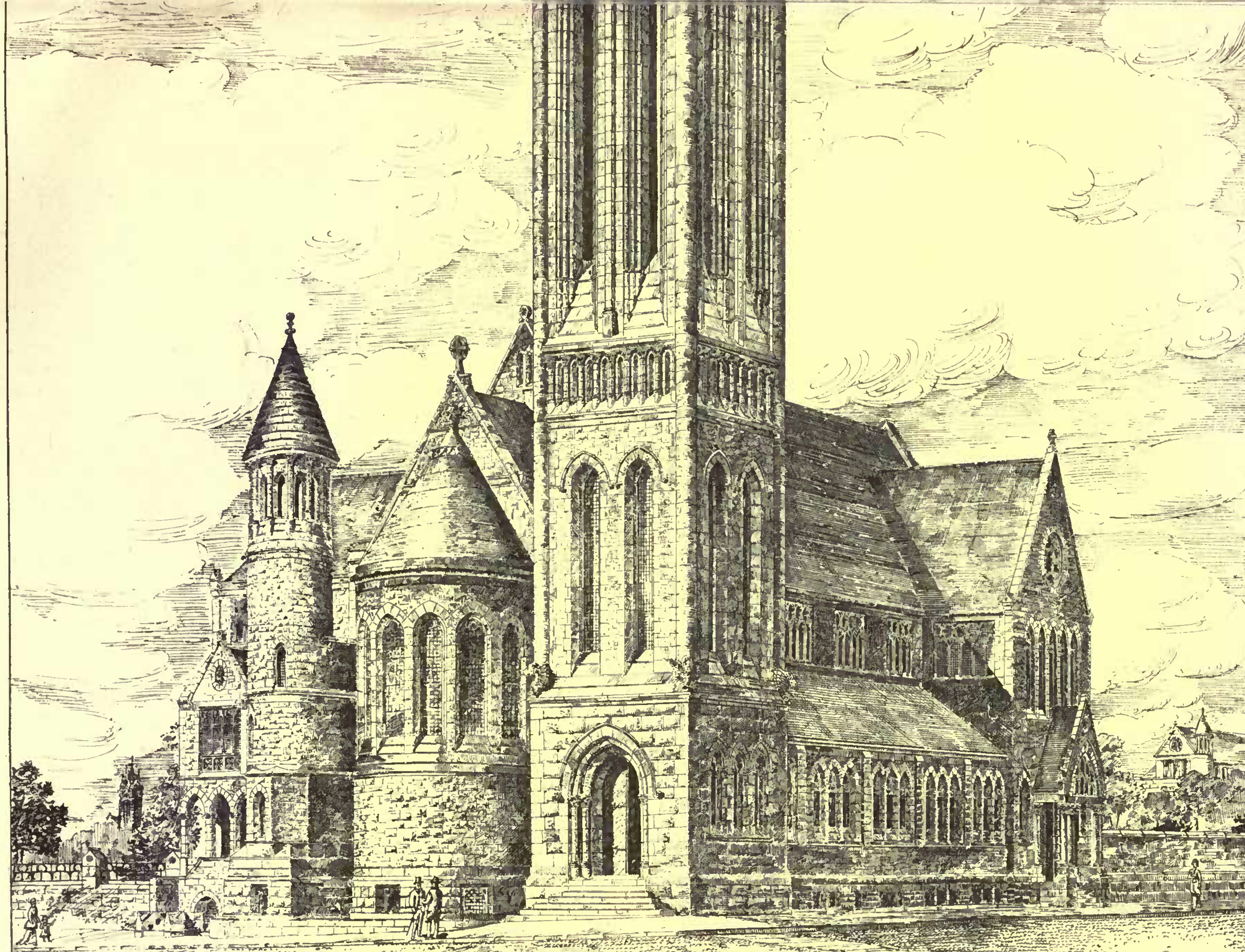
Bidders on Class 1 will be required to furnish, with bids, complete and full specifications and drawings.

All bids on any class of work must be accompanied by a full and complete itemized schedule of quantities and prices, the sum of which must equal the amount of the bid. ISAAC P. GRAY,

489 Governor and Pres. Board of Commissioners.

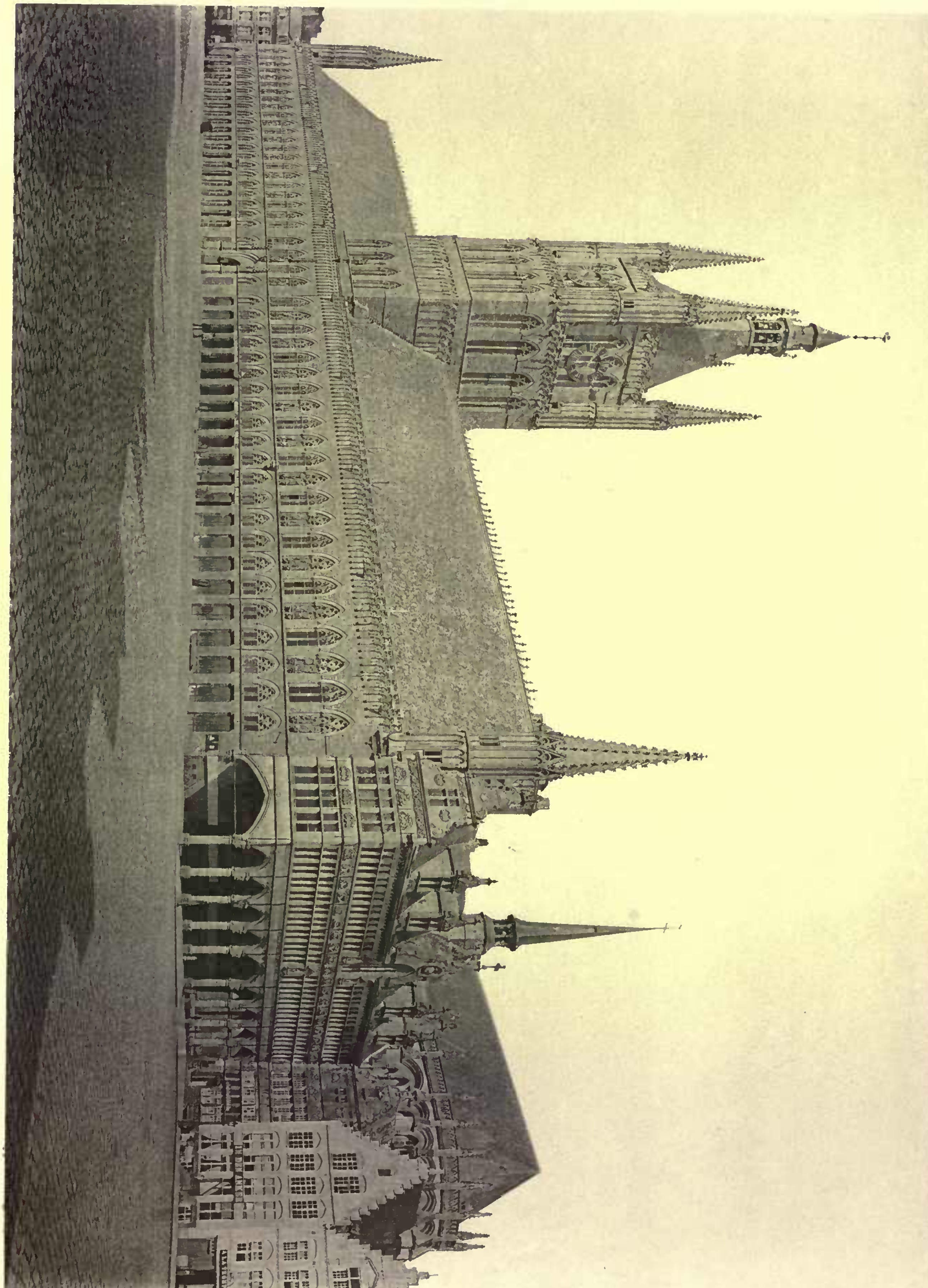
American Architect and Building News, Apr. 25 1885





ST. JAMES' EPISCOPAL CHURCH MADISON AVENUE COR 71ST. NEW YORK. R. H. ROBERTSON. ARCHITECT.

HELIOTYPE PRINTING CO. BOSTON



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CONTENTS.

AFTER a longer delay than we anticipated, our first "Monograph of Architecture"—the Harvard Law School building—is now ready, and we refer our readers to our advertising columns for further particulars. The standard of excellence we hoped to attain in this publication was sufficiently exalted, but we can say, without feeling that we overstep the bounds of modesty in so doing, that what has been accomplished surpasses our expectations ten-fold—perhaps even a hundred-fold. As the publication of other Monographs will depend on the reception the first issue encounters, and as we are more than ever persuaded that we have had a "happy thought" in conceiving the scheme, we trust that enough architects will feel they can afford to give the modest price asked to stamp approval on our undertaking and assure the publication of further numbers.

THE inquest in the Buddensiek case in New York has been rather a lively affair. The coroner, who, like most New York coroners, seems to have had a very proper opinion of his powers and authority, was judicious enough to call in at once the best experts to be found in the city, without wasting time in collecting the opinions of persons of no reputation, and the evidence obtained at the inquest is so weighty that the criminal trial to follow may be considered as already half decided. The testimony of such builders as Messrs. Darragh, Tucker, Eidlitz and Deems was to the effect that the bad quality of the foundations led to the destruction of the Buddensiek block, and in this opinion most architects will coincide, a brick wall on a firm base, even if laid in mud mortar, not being easily pushed out of position when stayed by floor beams. Upon the question of responsibility for the imperfection of the foundation, which was the main point of the discussion, a good many witnesses endeavored to throw light. One of these witnesses was Gotthold Haug, the legal owner of the ruined buildings, and of the land on which they stood, the conveyance of the estate to him, in return for the payment by him of three hundred and thirty thousand dollars, being properly recorded in the Registry of Deeds, together with the receipt for the purchase money. Although, by virtue of this deed, one of the largest real estate owners in New York, the modest Haug had been at work as a watchman for Mr. Buddensiek for a year or more, at a salary of a dollar a day; including with his services as watchman a faithfulness to his employer's interest which brought upon him the anger of the coroner, who, on his refusal to divulge some secret of his relations with Buddensiek, ordered him to prison, where he was kept until released by a writ of habeas corpus the next day.

ANOTHER interesting witness was Mr. Esterbrook, for several years Inspector of Buildings, who testified that Mr. Buddensiek was well known in the Bureau of Buildings as "an old sinner," and, on account of his general reputation, enjoyed the advantage of having three deputy inspectors set to watch his work where one would have been assigned to ordinary buildings. The present inspector testified that the walls of the fallen buildings were carelessly and hurriedly built with mortar composed of sandy loam carelessly mixed with lime; and a bricklayer employed on the buildings related that after working until they reached the fourth story he became so apprehensive as to their safety that he left them altogether. The testimony was so convincing, that after it was nearly all in, Mr. Buddensiek's sureties, who had bound themselves under a forfeit of thirty thousand dollars to produce him for trial, began to fear that he would run away, especially when the original charge, of manslaughter in the second degree, was withdrawn, and a new one, of manslaughter in the first degree, substituted for it; and they made their appearance in court for the purpose of surrendering their charge. Upon this, officers were sent after him, and he was arrested and put in the custody of the Tombs jailer, we believe, where he remains, together with his contractor for the mason work of the buildings, and the two deputy inspectors, against all of whom the same charge is brought.

ACCORDING to the Boston *Herald*, a great and most wholesome change has come over the fire underwriters in that city. "It is well known," the paragraph informs us, "that the mill mutual insurance companies have succeeded in reducing the fire losses to a very low percentage;" and the Boston Board of Underwriters, having apparently just discovered this fact, has been so much impressed with it as to have taken under consideration "a plan of abating, as far as possible, the fire losses in Boston." Among the methods of accomplishing this object which the Board contemplates borrowing from the mill mutual companies is said to be that of inspecting the mercantile and manufacturing risks in the city every three months, and advancing rates, or cancelling policies, in cases where the property is found in dangerous condition. This will, we need not say, be an admirable plan, and there are many more details of the science of reducing fire risks which might with much advantage be learned of the mill companies, but a great deal of work must be done, and a good corps of inspectors thoroughly trained, before anything like the completeness of control can be obtained over general manufacturing and mercantile business that the mill mutual companies exercise over their members, and we earnestly advise the underwriters to seize the opportunity to avail themselves of the most powerful outside aid that they could possibly have in the virtuous course that they have entered upon, by combining their efforts to promote the passage of the new building law. If they really think that the prosperity of insurance companies will be promoted by reducing fire losses, they are in a proper state of mind for comprehending that the passage of the new law would mean for them the saving of many thousands of dollars of insured property within the first year after its passage, and of further sums, increasing in geometrical ratio, each year, as the buildings now standing were, under its operation, gradually replaced by solid and incombustible ones. At present, the architects, the *bêtes noires* of underwriters' discourse, are maintaining, almost alone, the effort for the passage of the bill. A word from the representatives of the immense capital and influence engaged in insurance business would do far more to secure its enactment than all the arguments that a small body of professional men can bring forward, and if the bill fails for want of the insurance influence, the underwriters will have to pay the losses which it would have helped them to avoid, without much sympathy from people who think it a virtue to take care of one's own interests.

LA SEMAINE DES CONSTRUCTEURS quotes from a pamphlet just published by M. Durand-Claye some definite statistics in regard to the Gennevilliers irrigation and the sewerage of Paris, which are well worth remembering. For some reason, the results of the Gennevilliers experiments have been for a long time obscured by a curious indefiniteness, not to say wildness, of statement on the part of those who pretended to have examined them, which no impartial person seemed to think it his business to correct; but the city of Paris has now definitely committed itself to irrigation as a mode of sewage disposal, and it has become necessary to obtain exact statistics of what has been accomplished, for the benefit of the

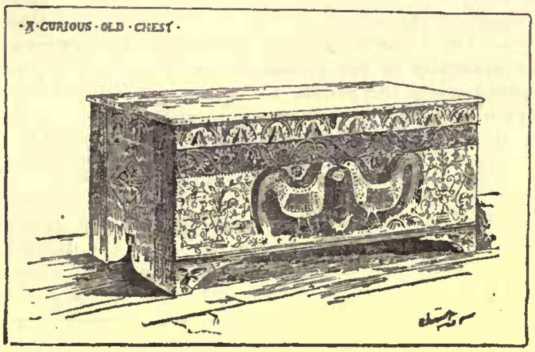
city engineers, and incidentally for that of the rest of the world. To begin at the beginning, the entire efflux through the sewers of Paris is ascertained to amount, on an average, to three hundred and sixty-two thousand cubic metres a day. This is almost exactly three-quarters of the total amount of water furnished by the aqueducts and the rainfall, the other quarter being carried off by evaporation, absorption into the soil, or by flow over the surface directly into the Seine. All the drainage flow, before leaving the city, is collected into three great intercepting sewers, two of which, conveying three hundred and eighteen thousand cubic metres a day, join into one at Clichy, just above a pumping-station, where engines of eleven hundred horse-power lift a part of the liquid into the pipes which convey it to Gennevilliers, while the surplus is allowed to flow into the Seine. The remaining intercepting-sewer carries forty-four thousand metres a day by gravitation to the Seine at Saint-Denis, but a branch is taken from this early in its course, which conducts a portion of its flow to Gennevilliers, to supplement the main irrigation system.

THE main irrigation conduit, which leaves the great double intercepting sewer at Clichy, is of rubble and Portland cement, forty-nine inches in diameter. After reaching the irrigated fields it gradually diminishes in size, throwing off branches, formed of concrete, and varying from fourteen to forty inches in diameter, until it ends in a small pipe, of twenty inches diameter, which serves as an overflow, to carry the surplus liquid of storms into the river. The supplementary irrigation-main branches in the same manner over a different portion of the territory, and the filtered effluent is conducted to the Seine by collecting drains. The present area of irrigated land in the Gennevilliers peninsula is fourteen hundred and thirty acres, and the system is continually being extended to new land at the request of the owners. The whole amount of sewage brought to the peninsula by the drains is eighteen millions of cubic metres a year, or about twelve thousand metres annually to the acre, an amount sufficient, if delivered at once, to cover it all about nine feet deep. Experiments have been made to determine whether a larger flow could be advantageously used, and for growing beets it seems likely that much more could be absorbed; but for general purposes the present flow is well proportioned to the needs of the ground, and the annual return from the crops is from two hundred and fifty to eight hundred dollars per acre, and even more where a cultivator has made a fortunate choice of a special product. The rent paid for the land has tripled within a few years, and averages now thirty-eight dollars an acre, while the population of the place increases constantly by the arrival of farmers anxious to share in the profits of sewage cultivation. Judging from the results obtained here, the engineers of the city have concluded that ten thousand acres of ground will satisfactorily and profitably purify the whole of the sewage of Paris, and have set about inquiring for suitable territory to that amount. The districts of Achères and Saint Germain, which have already been condemned and taken for the purpose, will furnish only three thousand acres, in addition to the two thousand contained in the Gennevilliers peninsula, so that five thousand more must, sooner or later, be found somewhere; but there can be no doubt that, with anything like the high rents paid at Gennevilliers, the returns from the land taken for irrigation would make the expense of taking it a safe and profitable investment for the Parisians. It is rather singular that the experiment of sewage irrigation, although rather rudely tried, should have proved so much more successful at Paris than in most places in England, but something is undoubtedly to be allowed for the difference in climate, and the science of sewage utilization will not advance much farther until careful investigations are made in regard to this point.

M. ROGÉ, the President of the Chamber of Commerce at Nancy, in France, has made a certain contribution to the discussion of the labor question, in a paper read by him before the Chamber, and reported in *Le Génie Civil.* M. Rogé's paper begins by pointing out the defects in the system, now becoming common, of sharing a certain part of the profits of a manufacturing business with the workmen employed in production. Excellent as the results of this system have been, M. Rogé thinks that it may tend, by increasing the income of the workmen in professions, to form in them habits of extravagance which will be the source of nearly as much complaint, and perhaps suffering, when reverses come, as the cut-downs and reductions of wages under the old method; and he suggests, with some reason, that a manufacturer who allows his men to participate systematically in his profits, is likely to find more difficulty in appropriating the profits of two or three years to the improvement of his machinery, or the introduction of new processes, than if he kept the whole income of the establishment under his control. As a remedy for this, M. Rogé proposes to make the premium, or share of the profits to be awarded to each man at the end of the year, dependent upon his personal success in executing through the year the duties entrusted to him. A foreman, on this plan, should have his dividend graduated inversely according to the cost of the articles produced in his department, so that he may be encouraged to vigilance in enforcing economy and efficiency, while the individual workmen should have special prizes for economy in the use of material, for thoroughness and finish of work, and for care in keeping their tools in good condition. In this way, as M. Rogé thinks, each man's share of profits would depend directly and visibly on his own care and activity, and the total result would be great increase of efficiency, without involving any sacrifice or compromise of the employer's interest.

EVERY one will be glad to know that the comparatively clumsy and slow methods of killing one's neighbors now in use are likely to be superseded by the introduction of an admirably neat and compact revolver, of a type entirely new, which, although so small as to be comfortably carried in the vest-pocket, enables the owner to shoot down ten persons before stopping to reload. It seems from *Le Génie Civil* that the inventor of this delightful instrument, having found in his practice that pocket Derringers and revolvers were much less steadily held in the hand than weapons of military size, and were in consequence easily wrested from the grasp of the user by an antagonist at close quarters, undertook to design a weapon which, without loss of portability, could be held securely, and fired with greater ease and certainty than those of the old patterns. These objects he has successfully attained, together with a great increase in the number of shots carried, by changing the cylinder which holds the cartridges in the ordinary revolver into a thick, flat ring, in which the cartridges are set radially. The diameter of the ring in the actual weapon is one and thirteen-sixteenths inches, and it is drilled for ten cartridges, of about twenty-two one-hundredths of an inch calibre. The ring fits upon a short cone in the box which contains the mechanism of the pistol, and can be detached and replaced in a moment, like the chambers of some patterns of revolvers. The remaining parts of the mechanism are very simple, and the whole, except the barrel and the trigger, is contained in a box two and one-sixteenth inches in diameter, or about the size of an average watch. The barrel, which is rifled, is one and three-eighths inches long, but a longer or shorter one can be substituted, as it simply screws into a socket left for it in the case. The pistol is intended to be held flat in the palm of the hand, the barrel protruding between the second and third fingers, which are helped in holding it firmly by two lugs cast on the case; and the firing mechanism consists of a small, curved lever, hinged at one end to the case, and shaped to fit the lower portion of the palm of the hand grasping the pistol. The rest of the lock is inside the case, and is arranged on the self-cocking principle, so that the pressing of the lever, by the contraction of the hand, turns the cartridge ring and secures it in position, and cocks and releases the hammer, by a single motion, which can at once be repeated after allowing the lever to return to its place by relaxing the grasp. A little wedge, which slides on the rim of the box, may be pushed under the lever to stop the movement, and prevent accidental firing; and after the ten cartridges are discharged, a simple movement opens the case, when the cartridge ring can be turned out, the shells removed and new cartridges inserted, quite as easily as in any pistol now in use. The whole length of the weapon, from the extremity of the barrel to the most projecting portion of the firing lever, is just four inches, which can be reduced to two and five-eighths by unscrewing the barrel. As the barrel follows the direction of a radius of the outline of the case, there is no way of sighting over it, but the firmness with which the pistol is held in the hand gives a certainty to the fire which the sights of a Derringer or a twenty-two calibre revolver do very little to secure.

HINTS ON PLASTERING, MORTARS, ETC.



IT is not an uncommon complaint from proprietors of dwellings, hotels, office-buildings, etc., heated by furnaces, or by steam, that in a few years after being constructed the interior finish of brick walls commences to scale off, if painted, or the entire plastering comes loose from the walls in patches four or five yards in extent, and seemingly rotten, the cementing qualities all gone. This scaling off of the paint or falling off of the plastering being confined to the brick walls only, the stud partitions, lathed ceilings, and furred brick walls remaining good, there is no room for doubt but that a very large proportion of the mortars used in the construction of modern brick walls, as well as that employed for plastering, is improperly proportioned, badly mixed and too quickly used, and hence possesses only in a low degree those valuable properties of strong coherency of their component parts and the quality of adhesiveness.

The responsibility for the damages to buildings arising from the employment of poor qualities of mortar should often rest as heavily upon the architect as upon the contractor, the bricklayer or the plasterer. In the vast area covered by the United States, there are so many different kinds of mortar employed for the purposes of constructing and finishing buildings, that it would be impossible to formulate a rule which would result in producing good mortar from the materials found in the various sections of the country. But it is the business of the architect to thoroughly familiarize himself with the materials found in the section covered by his practice and used for mortar-making. After becoming acquainted with the materials, the architect should specify the qualities and proportions of lime and sand to be employed, and the manner of mixing, and the age of the mortar before use.

As the defects which have been mentioned are confined to the interior finish of brick walls and do not affect ceilings or other plastering work not in actual contact with brick-work, it is evident that we must look farther than the plastering for the cause of the damage. Experience has clearly demonstrated that mortar, of whatever kind, is greatly affected, either for good or for evil, by the nature and the quality of the bricks or stones with which it is brought in contact, and, consequently, in order to obtain the best constructive results the material over which the mortar is applied should receive proper attention. An experiment made by the writer, with a view to demonstrating the action of the ordinary mixture of cement and lime mortar used by bricklayers in the City of Washington in foundation work on the common varieties of bricks, showed that the strength of the same mortar greatly varied with different kinds of bricks, being lowest with those of greatest porosity. Two hard-burned arch bricks, each having a surface measurement on their mortar faces of 7.75 x 3.75 inches separated under a pull of 43 pounds to the square inch. Two red bricks measuring 3.25 x 4.06 inches separated under a pull of 34 pounds to the square inch. Two salmon (soft) bricks measuring 8.75 x 4.3 inches, separated under a pull of 15 pounds to the square inch. The bricks had laid together for about six weeks and the joints of mortar between them were one-half inch thick, the same as those used for ordinary brickwork. The bricks were good hand-made stock moulded from moderately strong clay, but if they had been manufactured from meagre or weak clay, the results would have been lower than those which have been given. The cementing qualities of mortar, consequently, not only depend upon the kind of bricks to which it is applied, but also upon the nature of the clay from which the bricks are made, and also upon the manner in which they are moulded. Bricks made from tempered clay and solidly moulded increase the cementing qualities of mortar, but bricks made by the so-called dry-clay machine process lessen the strength of the mortar, as the first class of bricks are close and compact, and the latter are commonly open and porous. The poor results obtained with "salmon" or soft bricks was unquestionably on account of their great porosity, as during the setting of the bricks the mortar yielded its water of hydration too quickly, the porous bricks soaking it up more ravenously than would be done by a sponge. This is not to be wondered at, when we remember that each "salmon" or soft brick can easily absorb one and one-half pints of water.

From the foregoing remarks it will be seen that the falling off of the plastering from brick walls is more liable to happen in structures, the interiors of which are built with "salmon" or soft bricks. Some plasterers take the precaution to thoroughly wet the walls constructed with salmon bricks before applying the plastering. But even a thorough drenching of the bricks is of much less value than is commonly supposed, and can never be depended upon to secure immunity from damage in all cases. One reason why dampening the salmon-brick walls with water is not effective is that the plastering is commonly put on the walls during the summer season, and during exceptionally warm weather the evaporation of the water quickly takes place, and the porous bricks continue to absorb the moisture from the mortar, thus robbing it of its strength.

In cheap and shoddy buildings erected for speculative purposes it is not a common custom among architects, proprietors, or contractors to bestow much thought upon the manner in which the plastering or any of the other branches of construction is performed; but in all other cases it is better, if salmon bricks have to be used, for the architect to specify that all walls constructed of soft bricks shall be furred.

In the November and December, 1884, monthly numbers of this journal, the writer treated the subject of "Saltpetre Exudation upon Brickwork," and if the plastered or painted walls should be damp the interior finish would be destroyed in the same manner as brick walls exteriorily finished by painting or with stucco, as was explained in the previously-mentioned article, and which explanation it is probably not necessary to recapitulate in the present paper. In case the plastering is liable to become detached from brick walls on account of dampness, furring is the only remedy.

Having recommended furring, for dry walls constructed of soft bricks as well as for damp brick walls, it now only remains to say in the same connection, that those portions of structures which are to be continuously inhabited, such as sitting-rooms, chambers, etc., of dwellings, ought never to be plastered directly upon the brick walls. In buildings which are designed to be fire-proof, iron lathing would, of course, be employed in lieu of furring.

In our large cities cast-iron for architectural purposes continues to be commonly used for the piers or columns of the lower floors of stores and warehouses. These piers are sometimes hollow iron columns, ornamented on the sides exposed to the weather, in order to produce the desired architectural effect, and plain on the side or sides which form part of the walls of the apartment which the piers aid in enclosing. These apartments or stores are usually plastered, or have what are commonly termed hard-finished walls, and it is desirable that the inner sides of the piers should correspond in finish with the other parts of the interior walls. The inner sides of the iron piers are therefore often partially cased with furring to which laths are nailed in order that the surface may be plastered; in other cases, the iron surface is wholly covered with a wainscoting or casing of boards, and at other times the iron surface is merely painted. Both the furring and the wainscoting are objectionable on account of the expense and their tendency during a conflagration to warp and often break the columns, and when merely painted the surface is not good. A method which is now common property, has been successfully used to obviate the defects which have been mentioned, and it consists in piercing that surface of the pattern which corresponds with the inner surface of the pier to be plastered, with a number of small holes in which are loosely inserted either wrought or cut nails, or small pieces of wire, or cones or pyramids of cast-iron, so that they shall project from the surface. When nails are used they should be put in point first; when wire is employed, the axis of the wire should form an oblique angle with the surface, and all the nails or cast-iron should project from the surface of the pattern, as far as may be necessary to ensure a lock for the plaster. When the pattern is prepared, it should be laid face upward in the flask and moulded upon in any proper way, and when the pattern is drawn, the nails, wires, or pieces of cast-iron are to be left sticking in the sand; when the iron is poured in, it will surround the nails, etc., and when cold and removed from the sand the surface of the iron pier or column will be of such irregularity as to retain the plastering. Surfaces produced in this manner can be readily plastered after the piers or columns are placed in position, and the finish obtained upon them is better than that produced by furring the columns or piers, and in addition, it is cheaper, more durable, as well as more economical of space, and protects instead of endangering the piers or columns in case of fire.

Casing iron piers and columns with fire-proof materials, as well as lathing with iron lathing, is now often practised, in the construction of expensive buildings, but the method previously described could often be used to great advantage in cheaper structures where first cost is an item.

Having in the foregoing portions of the present paper somewhat enlarged upon the preparation of good foundations for the reception of the plastering, the question might reasonably be asked: — "Do not the defects mentioned in the commencement of this article often occur from the employment of inferior mortar? and, what constitutes good mortar? and what is the theory of its preparation?"

To the first interrogatory we would unhesitatingly reply in the affirmative. Too much and poor quality of sand, too little and poor quality of lime, too little mixing, too little time for ageing, too little time for drying after applying the mortar to the wall, too much hurry to get on the white coat, and get the cash for the job, are defects which are only too apparent under the present system of contract work to be enlarged upon here. There is no possible way to remedy these defects except through architects and superintendents charged with the execution of the work, for just so long as such defective plastering is accepted and passed by those whose duty it is to condemn it, just so long will the evil continue. There is, of course, no excuse for an architect or any other person who would abuse his power to such an extent as to impose unnecessary expense and trouble upon a contractor. But duty to his client and his own interest demand that an architect shall specify the proportions and

qualities of the ingredients employed for mortar, and require and know when it has been properly prepared and applied.

The second interrogatory: "What constitutes good mortar, and what is the theory of its preparation?" is not readily answered, especially the first clause of the question. "Mortar, being a compound concocted of such variable ingredients, and subject to a great variety of treatment, no specific value or estimation is possible, unless it is described as being compounded of a certain quantity of lime, to be mixed with a definite quantity of sand." We have previously stated in substance that "The best and most desirable property in a good mortar is, that the materials of which it is composed shall not only be competent to secure profitable coherency of its component parts, but also possess the quality of adhesiveness, and thus bind together or cling to the bricks or other forms in the structure in which it is to be used."

Aiken states the general theory of mortar as follows: In the white limes or nearly pure carbonates of lime the only effect of burning them is to drive off the carbonic acid. By slacking the lime becomes a hydrate, and in this state is capable of acting chemically, though feebly, on the surface of pure silicious sand. This combination causes the first setting of the mortar, which is also strengthened by the mere mechanical action of the sand. The greater part, however, of the lime has not combined with the sand, but remains in the state of a hydrate. In proportion as this latter absorbs the carbonic acid from the air, it gives out its water and passes to the state of carbonate; such mortar, therefore, acquires its final induration and dryness when the whole of the hydrate has been decomposed and the water has been replaced by carbonic acid. In losing twenty-two per cent of water it combines with forty-six per cent of carbonic acid, and, therefore, the mortar becomes the more solid and strong.

Limes derived from comparatively pure carbonates have a decided tendency either to yield their water of hydration too quickly, or not to part with it at all. If the water of hydration is permanently retained by the lime, there results a moist pasty product, and if yielded too readily, the rapid loss of the water of hydration results in a dusty, pulverized mass.

The Romans in dealing with such limes invented numerous shifts to counteract the tendency to the extremes which have been mentioned. "Hence, we find, in the best remains of the old Roman mortars a careful and perfect blending of the lime with the sand, and, generally, the insertion of thin porous tiles or bricks to absorb any superfluity of moisture." The Romans were the best mortar-makers of history, and it was an absolute condition imposed upon all persons engaged in engineering as well as architectural construction, that the ingredients of which the mortar was composed should be thoroughly blended together.

The differences between fat, poor, and hydraulic limes are so commonly understood that it is not necessary to enlarge upon them here. But whatever may be the character of the lime, if it has been freshly burned and the details of its manufacture have received proper care, it should be capable of thorough incorporation with any suitable material for the production of mortar.

It is, of course, evident there should be used sand which is as clean, sharp, and as coarse as possible. Should the sand not be naturally clean it is essential that it should be freed from foul and loamy admixtures by washing. For the production of good mortar it is an imperative condition that each particle of sand shall be completely coated with lime; fine sand, consequently, requires a larger proportion and a more diffusive state of the hydrate of lime than a sand coarser in its nature. Bank or pit sands, on account of their mixture with fine silt or loam, are not usually so desirable for mortar-making as those taken from rivers and similar sources. Sea sands, unless thoroughly washed, retard the setting and destroy the strength of mortars.

When a "batch" or quantity of mortar is to be "made up," all of the lime necessary should be slacked at least twenty-four hours before it is used. On slacking the lime all the water required should be "run on" at about one time, and after the lime has been properly submerged, the mass should be covered with a layer of sand or otherwise and allowed to remain undisturbed for the required period. The common error of working the lime with the hoe during the time it is slacking should not be practised. As all mortars are greatly improved by working them, "and as fat limes gain somewhat by exposure to the air, it is advisable to work mortar in large quantities and afterward render it fit for use by a second manipulation." The foregoing remarks apply to bricklayer's mortar as well as to coarse stuff used by plasterers for first and second coats; but in regard to the hair used for the latter classes of mortar it may not be amiss to state that it should be only medium in length, properly cleansed from the lime or other substances used in depilating the hides, free from lumps, and dry. Various materials, such as sulphates, etc., have been employed for increasing the strength of lime mortars, and when plaster of Paris is used for such a purpose it should be added in small quantities and thoroughly mixed with the lime, and in case of such addition of a sulphate, the proportion of sand can be somewhat increased.

On account of the interest usually exhibited regarding the strength of brickwork when laid in either lime or cement mortar and also of concrete when composed of cement mortar and broken stones or other similar material, we here append a description of two mechanical tests by compression made with such materials at the Watertown Arsenal, Mass., on the 18th of November, 1884.

These tests were made at the request of General Montgomery C. Meigs, U. S. Army, who communicated them to the writer.

The specimens were taken from the foundation under the steps leading to the north portico of the Capitol building, at Washington, D. C., the steps having been lately removed in order to allow the construction of the marble terrace wall now in progress around three sides of the Capitol building. The bricks and concrete were laid in position under the direction of General M. C. Meigs, twenty-five years previous to the time when the tests took place, the results of the tests being as follows: —

Bed surfaces faced with plaster of Paris.

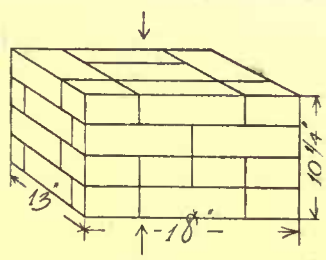


Fig. 1.

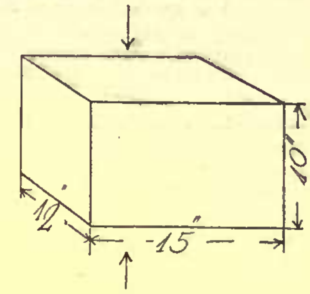


Fig. 2.

Figure 1. Four courses of brick laid in cement mortar.
Average thickness of bed joints, ⅝ inch.
Total weight, 178.5 lbs.
Weight per cubic foot, 128.6 lbs.
Compressed area 13 x 18 inches = 234 sq. inches.
First crack at 360,000 lbs. = 1538 lbs. per sq. inch.
Crushing strength 578,000 lbs. = 2470 lbs. per sq. inch.

Figure 2. Concrete composed of cement mortar and broken stones.
Irregular block.
Total weight 150.5 lbs.
Weight per cubic foot, 144.5 lbs.
Compressed area 12 x 15 inches = 180 sq. inches.
First crack at 112,000 lbs. = 622 lbs. per sq. inch.
Crushing strength 135,300 lbs. = 752 lbs. per sq. inch.

Charles T. Davis.

THE DISCOBOLUS OF NAUCYDES.[1]

London, England, December, 1884.



Another hand-book of Greek and Roman sculpture, as thorough as the volumes of A. S. Murray and W. Perry, and more handy, comes to us from Boston. It could not come at a more happy time than just after the installation of cast museums at Cambridge and South Kensington. "Principally," as the title announces, and it might almost be said "substantially," it represents the "Bausteine" (Building Stones) of the late Dr. Friederichs. The original work had direct reference to the antiques and casts of the Museum of Berlin, a very extensive collection, but still of necessity incomplete. The editor and translator therefore, — Mr. Cady Eaton, formerly Professor of the History of Art in Yale College, — has added many supplementary articles of his own, besides various annotations which for the most part very judiciously check or correct some of the more questionable theories of Dr. Friederichs. Not, however, that Friederichs was habitually given to theorizing in the wild manner of too many of his compatriots, when given as they are — be it said with all respect — to expatiating on epochs of art, schools, styles, ascriptions, till they lose their own way in their eagerness to keep out of routes that have been well cleared by rivals and predecessors. The book is really a hand-book in the sense that it may be conveniently held in the hand in front of the objects criticised during a visit to a gallery — the chief, and indeed for so many people the only occasion when the detailed criticisms it affords are of interest or of use. It has also the negative merit, which latterly we have been learning to value in Europe, of not offending us — entirely unillustrated as it is — by employing bad art as professed aid to the appreciation of the finest.

The scheme of the book comprises a distinct description and criticism of each several work of ancient sculpture which is of interest from its excellence or place in history. The arrangement is as precisely chronological as the nature of the case admits, and each division is introduced by a brief statement of the artistic character of the period. In giving the book very hearty commendation we are far from saying that the field is not open for a still better book, — or, we would prefer to say, a farther corrected edition of this, without any considerable increase of bulk. There is "something," says Pope, "previous e'en to Taste; 'tis Sense," and how far the pretensions of

[1] *Hand-Book of Greek and Roman Sculpture.* By D. Cady Eaton, M. A. (formerly Professor of the History of Art in Yale College). Principally from the "*Bausteine*" of Dr. Carl Friederichs, late of the University of Berlin. Second edition, enlarged and revised. Boston: James R. Osgood & Co., 1884. Price, $2.00.

plain common sense may be useful after German learning and industry have done their utmost and taste its best, might be exemplified in some of the articles which the editor lets pass without observation. Discursive criticism, however, would be less interesting and less useful than remarks upon a particular statue.

A statue of a youth holding a discus in his left hand and standing in a peculiarly expressive attitude, has long been known by the title first assigned to it by E. G. Visconti, of "The Discobolus of Naucydes." It stands, and has stood since its discovery by Gavin Hamilton on the Appian Way, in the Sala of the Biga or marble chariot, in the Vatican. The completeness of its preservation is remarkable; this seems to have been largely owing to the number and solidity of the marble stays which are still attached to the limbs. These are more than are necessary for the support of weights, but seem to have been left to strengthen the parts against shocks in transport and not afterwards cut away. The good preservation throughout, the fine outlines and graceful yet vigorous proportions of the figure, have always made it a favorite model with students. On this account it has gained in Italy the name among artists of *la statua di precetti*, and in casts it is one of the most frequent as most useful accessions of English art-schools. There is an ancient copy in the British Museum, but casts of the finer statue at Rome are easily obtainable.

It has been said that the attitude is peculiarly expressive: it is manifestly intended to be so; but as in other parallel cases, this manifest intention throws upon the spectator the responsibility of duly appreciating the expression, of divining what is the dominant and immediate motive which decides a specific combination of gestures, aspect and attitude. This appreciation is required even by a photographer if he is to determine rightly the most characteristic point of view; but it is above all required by the student, who only merits the name of student when he copies the figure before him under the influence of such sense of its impressiveness as will secure him from reducing it to blank dullness or insensibly leaning to a perfectly false interpretation.

How far astray interpretation may go is exemplified in the title "The reflecting Discobolus," which heads the article upon it in the hand-book or guide now under consideration. It is fair to say, however, that this erroneous gloss is not due to Professor Friederichs. We must, I fear, lay it to the charge of the editing professor. He in his turn, it may be mentioned here, must certainly be acquitted of the blundering title, "The Venus of Kallipygos," for his notes indicate clearly that he understood the distinction which gave to Venus the title Kallipygian. Professor Kekulé has given an elaborate interpretation and description of this quoit-player in the German *Archæological Journal*, 1866, p. 169. He says justly, "the right hand is raised in readiness to grasp the discus, and there is an involuntary play of the fingers." Less happily he goes on,—"the next moment the youth, stepping forward with the left foot and straightening himself, will raise the discus with both hands to the height of the eye." Some vase paintings do show the discus so raised and with the left foot in advance (Panofkabild. Ant. Sel.), but this does not suit our statue. If this discobolus is to move his left foot in advance of the right, before the actual delivery of the discus, he must change the position of the right on the ground, and turn it more outwards, but this is contradicted by the firm set so distinctly marked by the contraction of its toes in immediate preparation for the cast.

Professor Overbeck, who hands over the statue to Alcamenes from considerations which are truly not worthy of being further considered, marks down various—as he thinks—misconceptions of the gesture by various critics, and adds another on his own account. This peculiar gesture, he says, does not denote that the athlete is reckoning on the fingers the distance of the mark, nor is his look directed to this mark, but towards the ground at a short distance; nor is it a gesture with which the youth is involuntarily recalling himself to greater attention; nor, as interpreted by Friederichs, an "involuntary sign by muscular expression of a thought which is occupying his mind,—an unconscious monologue;" "the arm," he says, "is extended and raised, and the fingers play (are in lively movement) in order to test their elasticity, and at the same time to elicit a feeling of the favorable moment when his force is most collected, the tension of his muscles the briskest, his grip the most secure; at the next instant the discus with a swift movement is to be raised high in front and transferred to the right hand, when the proper action as we know it from Myron's statue, begins."

Perry adopts, from Overbeck, or originates on his own part, the notion that the athlete is moving the fingers of his right hand as if to test their strength and pliancy, but he unhappily misses the better hint as to the direction of his look, and says, "he is measuring the ground with his eye." Also, he says he is in the act of "taking up his position,"—not, that he has taken it up.

Visconti, the earlier critic, praises the beautiful proportion of the limbs, the simplicity of the expressive attitude of the athlete, who "plants his right foot on the ground to prepare for hurling the heavy discus which is still held in his left hand, preparatory to passing it to his right for the throw." So far excellent, but "his physiognomy," he pursues, "expresses the attention of one who measures at a glance the course which he has to give to his bronze discus, or who estimates the marks of his competitors."

Mr. Murray (1,233), in treating of the motive of Myron's type, observes: "It is clear that the motive has been taken from real life, and has been treated in a manner as far removed from ideal treatment as was probably possible at the time." He then goes on to say: 'Compare, for example, the other well-known type of a discobolus, who, as seen in two statues in Rome, stands with one foot drawn back, in the act of beginning to collect his impulse for the throw. Here the motive is also real, but the treatment is due to the ideal manner, which imparts a dignity not likely to have been preserved on the occasion." But in this case how shall we escape the obligation to reconcile ourselves to the notion that an accomplished Greek sculptor only attained the ideal at the cost of falling into the abysmal bathos of the Inappropriate?

The hair of the figure is short, but bound by a narrow band; this Visconti assumes to be the *tænia*, indicating a victorious athlete, and the objection of Friederichs that it ought as such to have long ends pendent behind, need not be held fatal.

It ought not be difficult to make it clear that the sculptor intended to represent a discobolus who has taken up his position for the throw, and stands precisely at the momentary pause before he will swing the discus, now sustained by his left hand, round forward and upward to the level of the eye for the aim; holding it there for the moment with both hands, and at the next carrying it backward with the right, as his knees bend and his body inclines forward, to enable him to concentrate the whole force of his system on the discharge; he will take, in fact, the very attitude of the discobolus of Myron. In the copy of this in the Massini palace at Rome, and in correspondence with a gem, the exertion turns the head of the athlete also to the right; in this respect the statue in the British Museum differs, but the head here may not be the original, or, being original, may be one of the frequent arbitrary variations of a copyist.

A small bronze of the British Museum, which Mr. Murray engraves, represents the intermediate attitude, with the discus held high and in both hands. Here the right foot is in advance of the left, as in our statue and as in the Myronian.

It will have been noticed that much if not the chief difference of opinion concerns the peculiar position of the fingers of the right hand. These fingers are somewhat restored, but all the critics agree that there is no question as to the correctness of the restoration; and I am convinced myself of this by a very minute examination, at Rome, of the statue itself. These fingers are simply curved and somewhat stiffened, in natural preparation for grasping the discus, which is coming forward instantly; how instantly is indicated by the contracted toes of the right foot. This contraction is to secure a steady position for the foot when the cast of the discus is in absolute act; it were absurd for the athlete to stand cramping his toes before that moment. Thus it is that the artist indicates a very precise moment intermediate between one pose and another immediately to ensue. The height of misapprehension is reached when the sense of this momentariness is so absolutely lost that the figure is regarded as calculating, considering, nay, as reflecting, according to the title by which Mr. Eaton heads his translation of Dr. Friederichs's article.

It is free for us to ask ourselves whether this required suggestion of merely momentary pause between preparation and act is made sufficiently distinct? If so, how comes it that it has failed so frequently to be recognized? I suspect that the sculptor is not to blame, but that the misconception as to what the athlete is doing, has been just doing, and is immediately about to do next, are due to modern unfamiliarity with the exercise in which he is engaged and its aspects.

I was once looking at a sea piece, with great admiration of the transparency yet movement of the water, the clearness of reflections, elaborate finish of spars and rigging, and so forth, when a naval friend, agreeing with my approval of the picture, remarked: "The captain's dead." In explanation, he pointed out that the rigging of a large vessel was in studied disorder, and that the interval of puffs of smoke implied the firing of minute-guns. Technical illustrations in art demand technical experience in the critic. If hurling a discus in ancient fashion were as familiar an exercise among ourselves as cricket, and as it was in ancient Greece, it is probable that the significance of the gestures and attitude of this figure would be apparent to all of us at a glance. Still, that several attempted interpretations of these have missed a sense of momentariness and inclined to ascribe to the athlete a certain air of deliberation, seems due to a characteristic of style which may have some bearing on the question of the school from which it had origin. The peculiarity which is alluded to is what may be described as a tendency to squareness, to quadrateness: a quality which, according to Pliny, was ascribed to the somewhat uniform type of the statues of Polycletus.

A quadrate figure (*quadrata statura*) in a favorable sense is a compact, well-set figure, but the phrase when used as expressive of a drawback on style must be understood to refer to a preponderance in a composition either of right angles or lines which tell as somewhat too closely parallel. This explains the contrast ascribed to Myron's art. He was said to have been the first to combine truthfulness to nature with a certain complexity (*primus hic multiplicasse veritatem videtur*) and to practise an art of more manifold harmonies (*numerosior arte*) than Polycletus. These expressions seem to correspond most aptly with the contrast between the daring variety introduced into the attitude—the contorted attitude, as Quintilian calls it—of the discobolus of Myron and the simple squareness which prevails in the statues which we have the best reason to accept as representative of works of Polycletus: the Doryphorus or Spear-Bearer, and the youth binding the tænia of victory round his head, the Diadumenos. The two repetitions of the latter statue in the British Museum will explain this. As regards the Discobolus now under consideration, there is no doubt that when we place ourselves at the best point of

view, at that which was most favored by the artist, the silhouette is as varied as admirable, but it is no less true that when we move from this, the outlines of the arms very soon fall into unpleasant and confusing parallelism with the body or with each other, and those of one leg with the other.

Polycletus no doubt may have executed a statue of a discobolus, though there is no mention of his having done so; but this being the case, it seems best to avoid disturbing the conjectural ascription of Visconti, and to continue to refer to the statue as the Discobolus of Naucydes. When a better claimant can make out a better case, the ascription may be changed. To Naucydes of Argos it was originally given by Visconti, simply on the strength of Pliny's notice that a discobolus was one of the statues which gained this sculptor a high reputation. This somewhat thin argument may now be strengthened by recalling the connection between Naucydes and Polycletus, of whom he is said to have been both the brother and the instructor, and who therefore may naturally be considered to have favored and perhaps exaggerated some leading peculiarities of his style. (*Paus.* 6, 6, 1 and 2, 22, 8.)

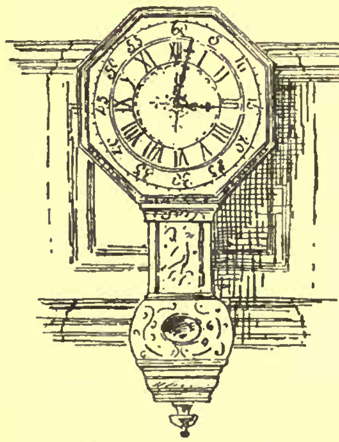
It must be observed that there is much difficulty in reconciling the ancient notices which sometimes indicate an elder and a later Polycletus, and sometimes seem to necessitate the supposition of an earlier and later Naucydes. The combinations above may possibly be thought to have no unimportant bearing on these questions.

W. WATKISS LLOYD.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

THE SEVENTH-DAY BAPTIST CHURCH AT NEWPORT, R. I.



THIS venerable edifice, for many years the place of worship of the Seventh-Day Baptist Society in Newport, has, within the last few months, passed by purchase into the hands of the Newport Historical Society, and will in future be occupied by that body as its cabinet and meeting-room. After long disuse, the building was re-opened to the public, with appropriate ceremonies, on the evening of November 10, 1884.

The church, when purchased by the Historical Society, was found to be rapidly falling to decay, through long neglect and the action of the elements. A most thorough restoration became necessary, in the course of which portions of the work were entirely replaced with new, the character and ancient detail being scrupulously adhered to.

The Seventh-Day Baptist meeting-house, or church, as it is more generally styled, has a history of one hundred and fifty-five years, having been erected in 1729. It demands more than a passing notice from the student of Colonial architecture, for its venerable and sacred associations. Its structural and decorative features are thoroughly in unison with the best building practice of the second period of Colonial architecture, and are shown in detail on the accompanying sheets of sketches made in the church itself, previous to its restoration.

In the year 1678, Samuel Hubbard, one of the seven founders of the Sabbatarian Society in Newport, wrote to a friend in Jamaica, saying, "Our numbers here are twenty; at Westerly, seven; and at New London, ten." From the diary of the same Samuel Hubbard we learn that the church was organized in 1671. The Society always claimed to be the oldest Sabbatarian, and the fifth Baptist church in America. The first pastor was William Hiscox, who died May 24, 1704, in the sixty-sixth year of his age. Joseph Maxon was chosen to fill the office of travelling preacher for Westerly in September, 1732, and in October of the same year he was made pastor of both the Newport and Westerly churches. The Newport church, previous to the Revolution, maintained a strong and stirring organization: among its members were men reputable for their talents, learning and ability, and holding honored stations in public affairs. The war scattered the congregation, and the church never recovered its former prestige. Henry Burdick was ordained pastor December 10, 1807. In 1808 the membership was reduced to ninety, and in 1809 to eighty-seven. The last pastor was Lucius Crandall. The records of the church terminate in 1839, and the last sacred services were held in that year. The sole surviving member of the Society living when the church passed out of the hands of the Sabbatarian trustees was Mrs. Mary Green Alger, who died on the 11th of October, 1884, at the age of ninety-three years, nine months and nine days, just one month previous to the dedication by the Historical Society. The church in the town of Westerly grew and prospered, and is still in a flourishing condition. Under the liberal Charter and Constitution of Rhode Island, the towns of Westerly and Hopkinton have always recognized as holy the seventh, instead of the first day of the week. It is a curious sensation to walk through the streets of those towns on a Sunday morning and hear the buzz of machinery and the various sounds of a striving and busy community.

In 1706 the Sabbatarian Society purchased, in the then town of Newport, a lot of land, situated at the junction of what are now known as Spring and Barney Streets, from Jonathan Barney, for "twenty-one pounds, six shillings, and eight pence, current passable money at eight shillings per ounce silver." The deed was taken in the name of Arnold Collins, goldsmith, a member of the Society and the father of Henry Collins, a distinguished citizen who took an active part in the affairs of the town and colony, and was one of the founders of the Redwood Library, giving the land on which that building stands. Two smaller portions of land were afterwards added to the church lot.

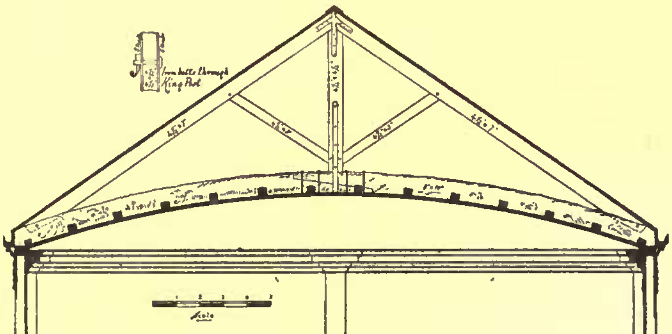
At a meeting of the Society held November 9, 1729, it was voted "that a meeting-house be built, thirty-six feet in length and twenty-six feet in breadth, on part of that land whereon the present meeting-house now stands; and voted, at the same time, that Jonathan Weeden and Henry Collins be appointed a committee to undertake the whole affair of erecting said house, and to raise money by subscription. Voted at the same time, that the two afore-mentioned brethren do their endeavors to make sale of their present meeting-house to the best advantage they can, and dispose of the money towards the better furnishing of the house they are to erect."

The character of the first meeting-house is unknown, but it must have been a very simple affair. The house of 1729 is the subject of this sketch. Like most of the colonial buildings which I have measured, the dimensions overrun the established plan and instructions. The church measured thirty-seven feet front and twenty-seven feet deep, and all its parts and details are laid out with scrupulous exactitude with reference to symmetry and proportion.

The exterior of the church is of the most severe and barn-like character; with two rows of windows having plank frames, and with a shallow cornice, made up of a gutter and bed-mould, the latter mitreing around the heads of gallery window frames. The entrance door has no features worthy of notice, and the steps are of Connecticut brown-stone, the usual material used for that purpose in colonial work.

The roof is a simple double pitch, the frame being of oak timber and shown on sectional drawing. The tie-beams, hewn into curves, are curious instances of framing. All furring-down for the ceiling is dispensed with, and the lathing is nailed directly on the 4″ x 4″ furs, which are tennoned between the tie-beams.

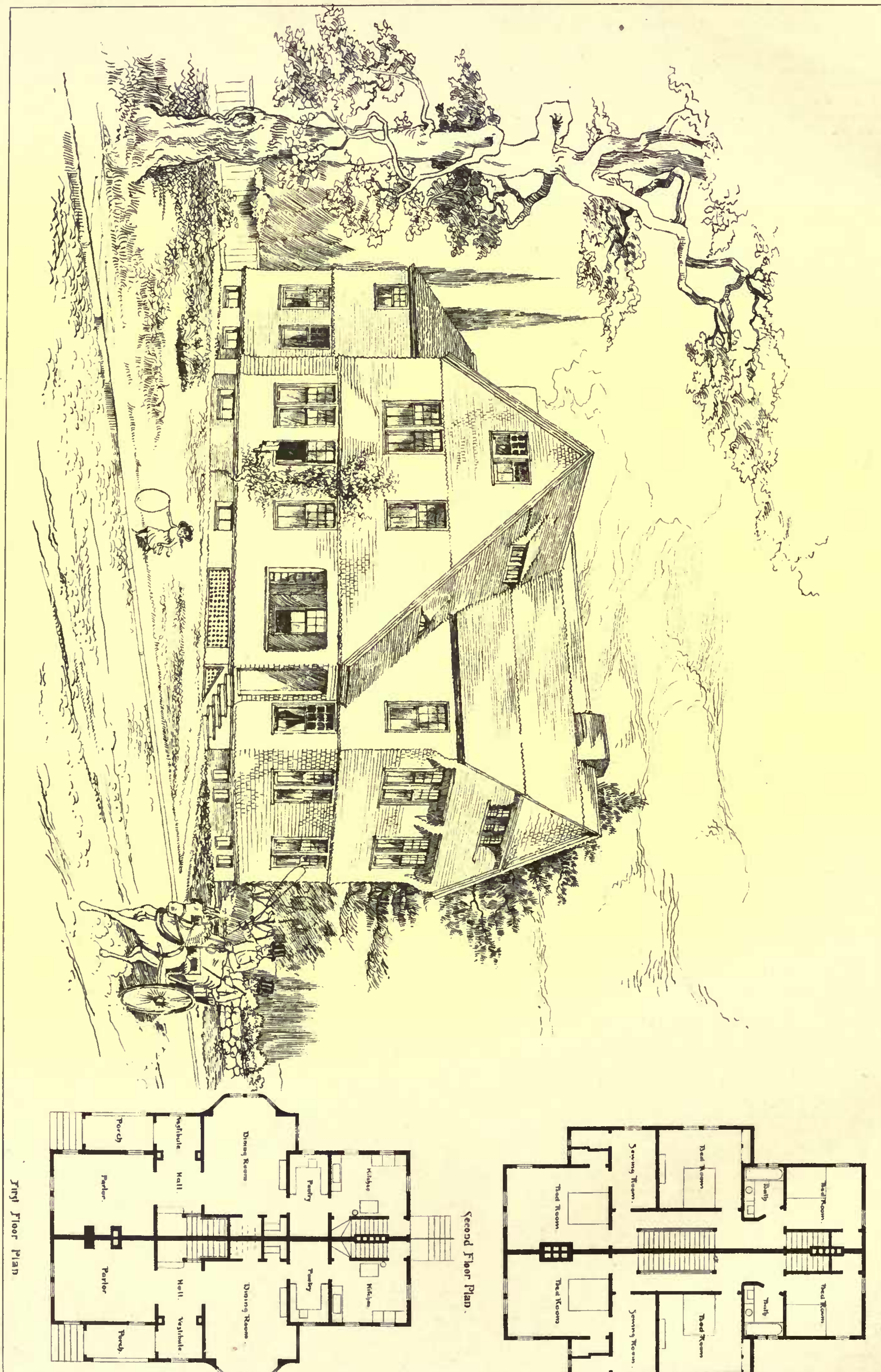
All the timbers, with the exception of the tie-beams, are squared. The framing at the junction of the principals and tie-beams was badly conceived, and the hidden tenons have rotted off, permitting the building to spread badly. In restoration it became necessary to insert two tension-rods and draw in the walls to their original vertical position. These rods run across the building at the line of the cornice.



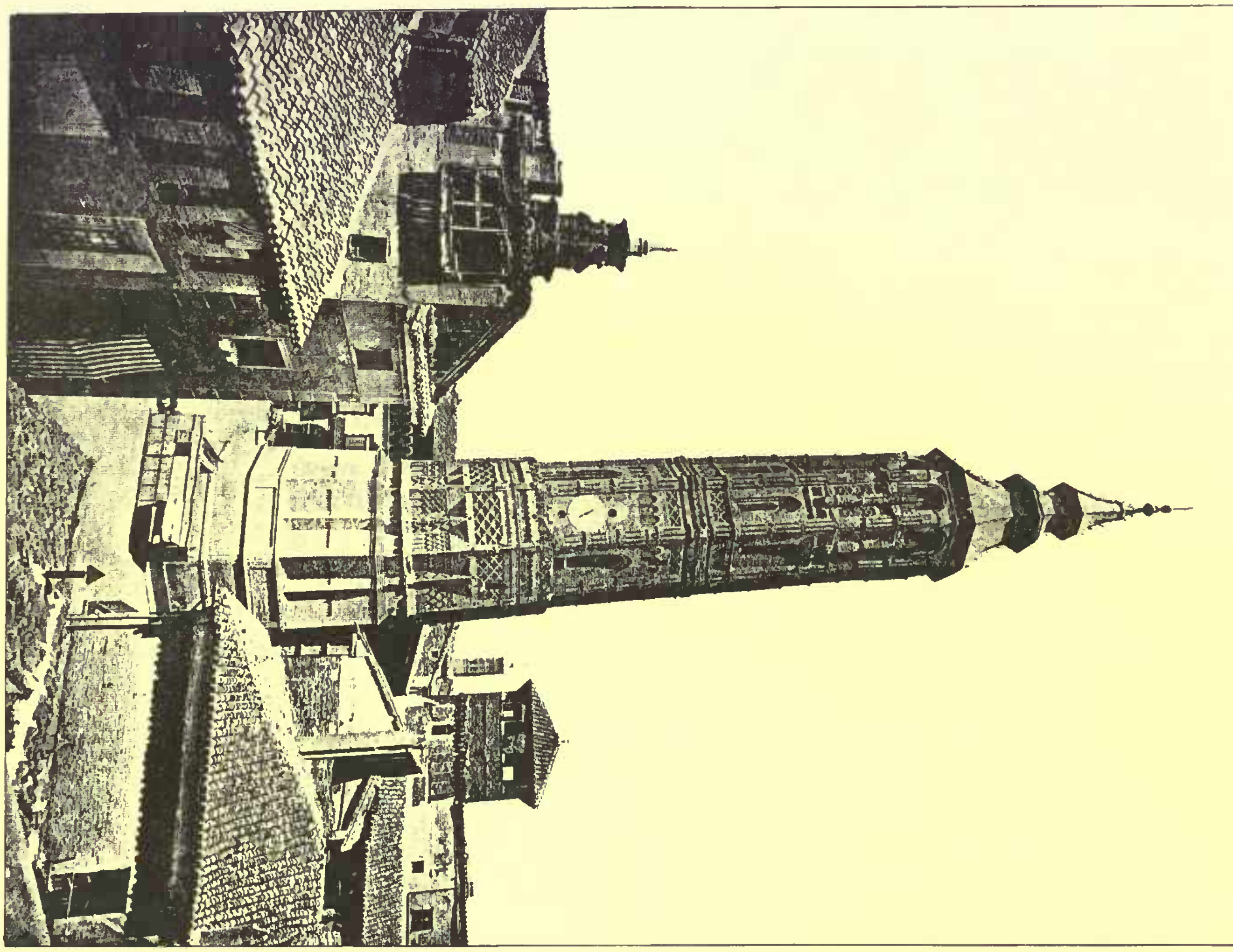
NOTE. — The tie-beams are of rough hewn timber, curved by the axe, scarfed in centre. The iron straps are roughly forged and the bolts which secure them to the king-post are simply driven through, the ends turned over and keyed. The timber is all of oak. The furs for ceiling are about 4″ x 4″ and tenoned into the tie-beams at each end. The lathing is directly on the furs. Each principal runs down to a feather end, but is tenoned into the tie-beam and pinned. The building is spread badly, and in its restoration iron tension-rods have been put in between the plates.

The large drawings indicate the conscientious attention to detail which the Colonial mechanics were wont to bestow upon their works. The greater part of the inside finish is made of red cedar, painted white. All the members were wrought by hand, and the amount of curved and moulded work, including mitres, is extreme.

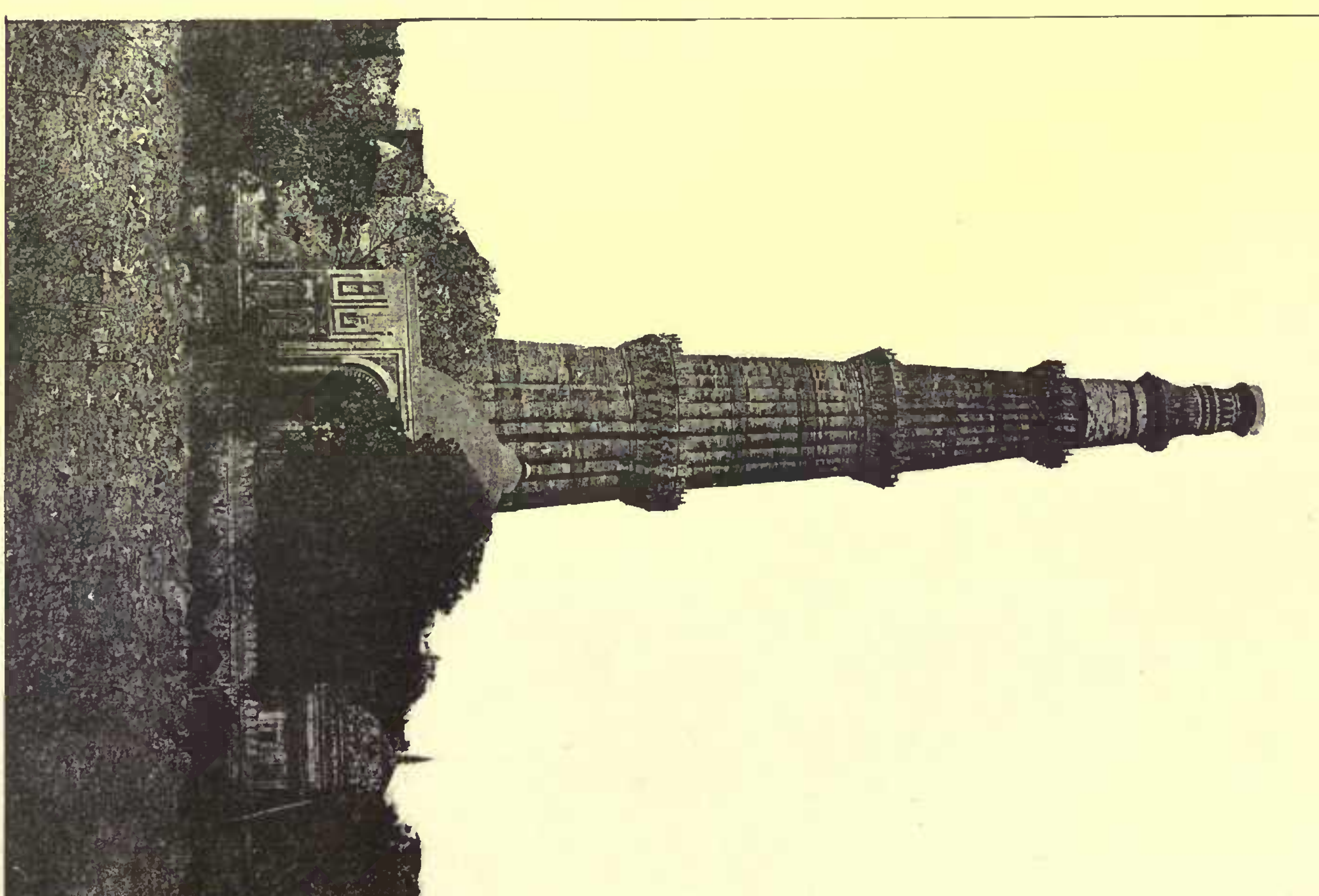
While engaged in making the measurements preparatory to the restoration, I was struck by a coincidence which gradually developed as the work progressed. It has always been a mystery, unsolved by investigation, as to who designed Trinity Church in Newport. It was erected in the years 1724–25, through the instrumentality of the English Society for the Propagation of the Gospel in Foreign Parts. The plans and instructions must have come from England, as it was not until some years later that architects of talent, like Peter Harrison, emigrated to the colonies. It is a free copy of Wren's church of St. James, Piccadilly, having the general character of that edifice, with, however, some strongly marked differences. Instead of the row of Corinthian columns along the gallery, and supporting the vaulted ceiling, it has square and fluted piers, and the lower piers are much smaller, although panelled in the same way as those at St.



Double House for Charles H. Ratan · Brookline · Mass.

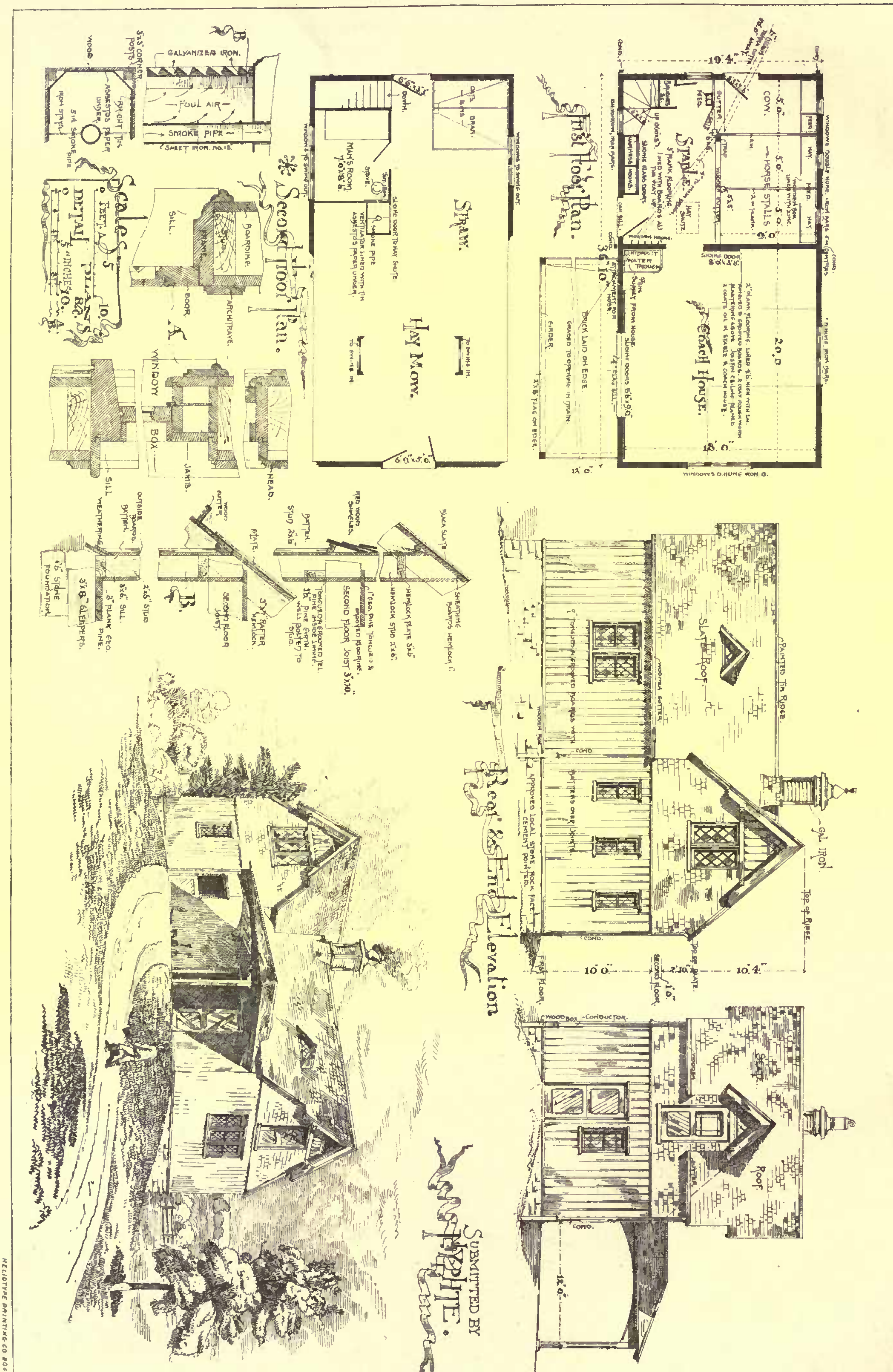


The Leaning Tower, Saragossa, Spain.

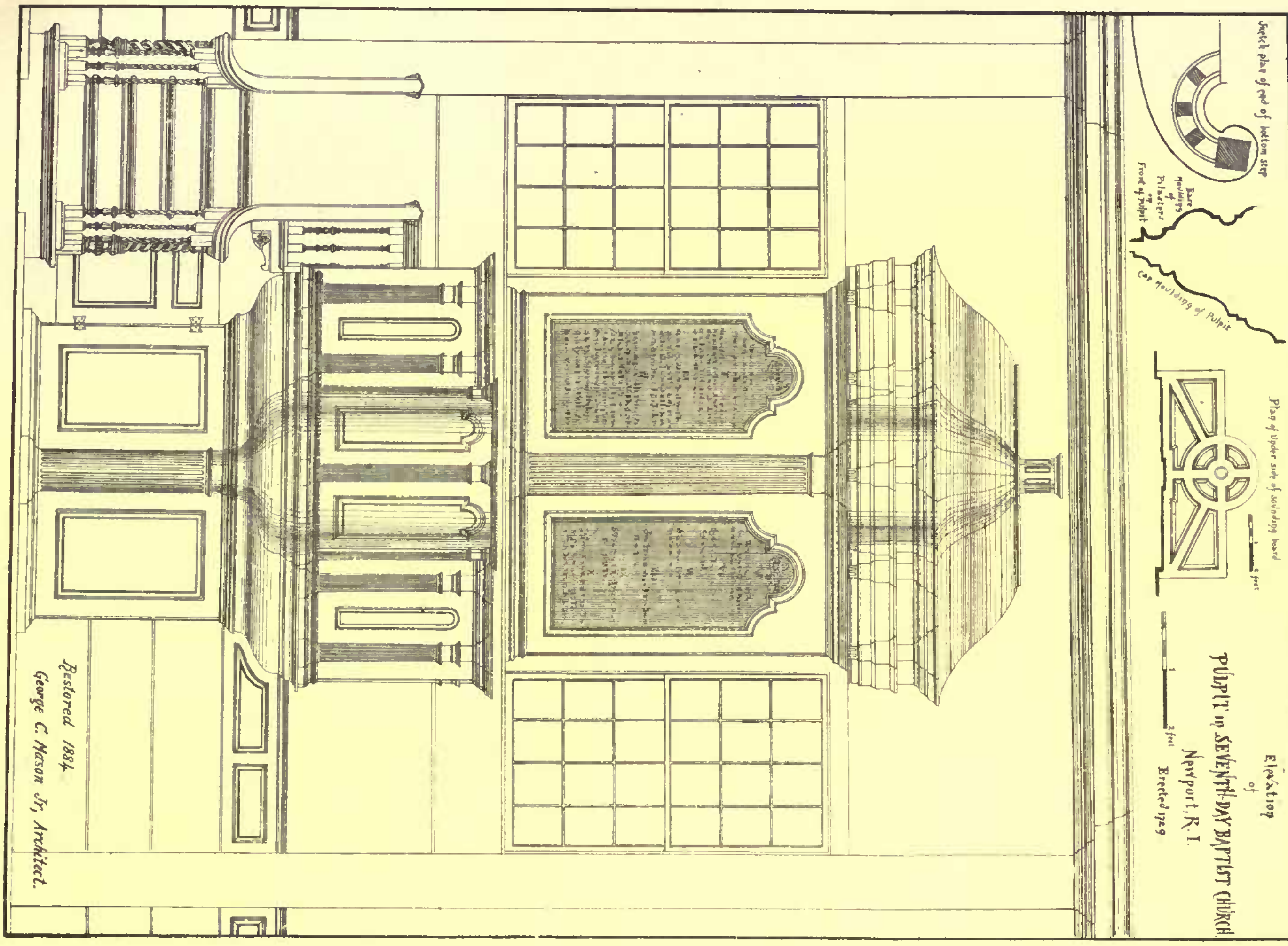


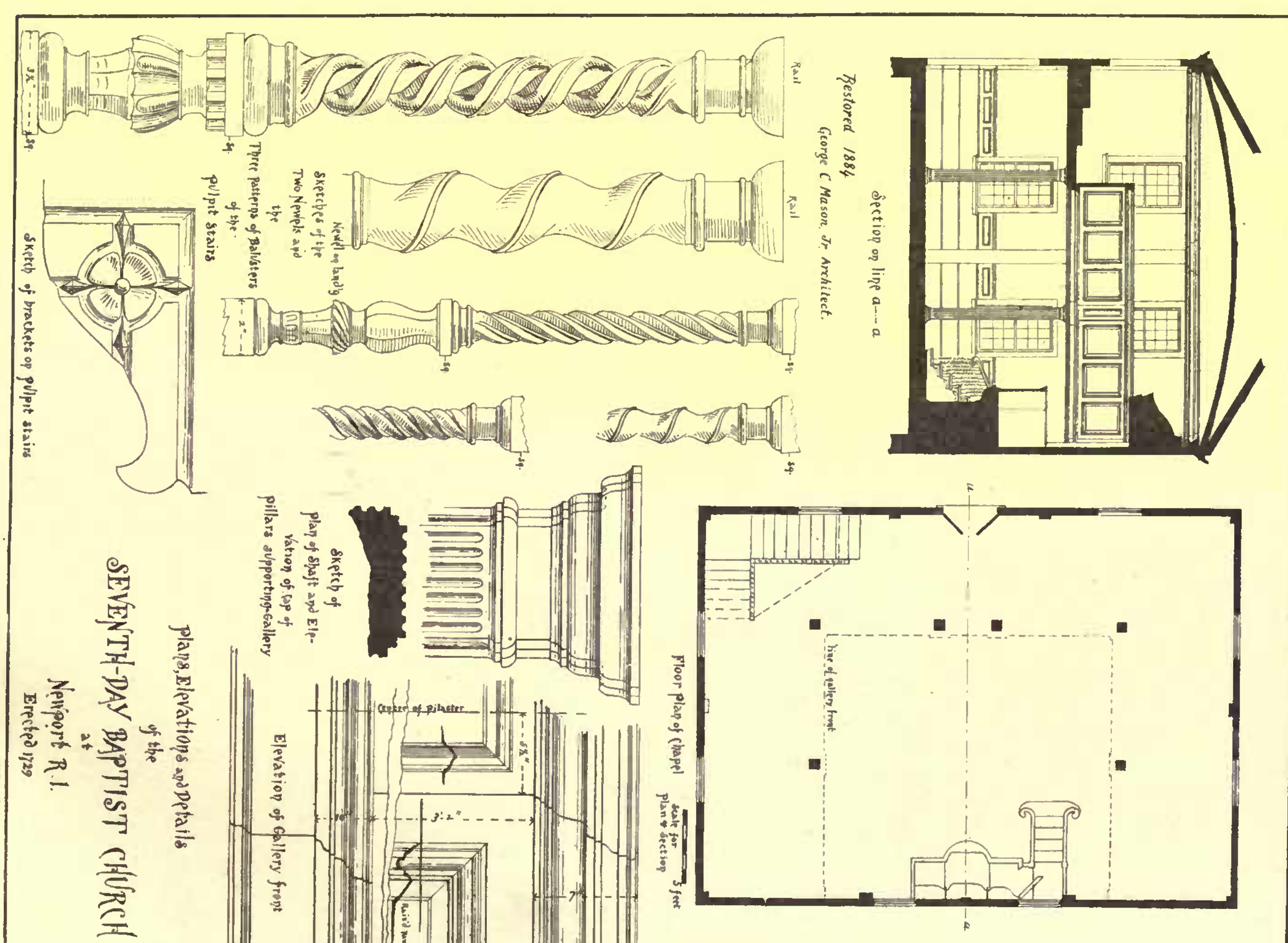
The Minar of Kootub, India.

HELIOTYPE PRINTING CO. BOSTON

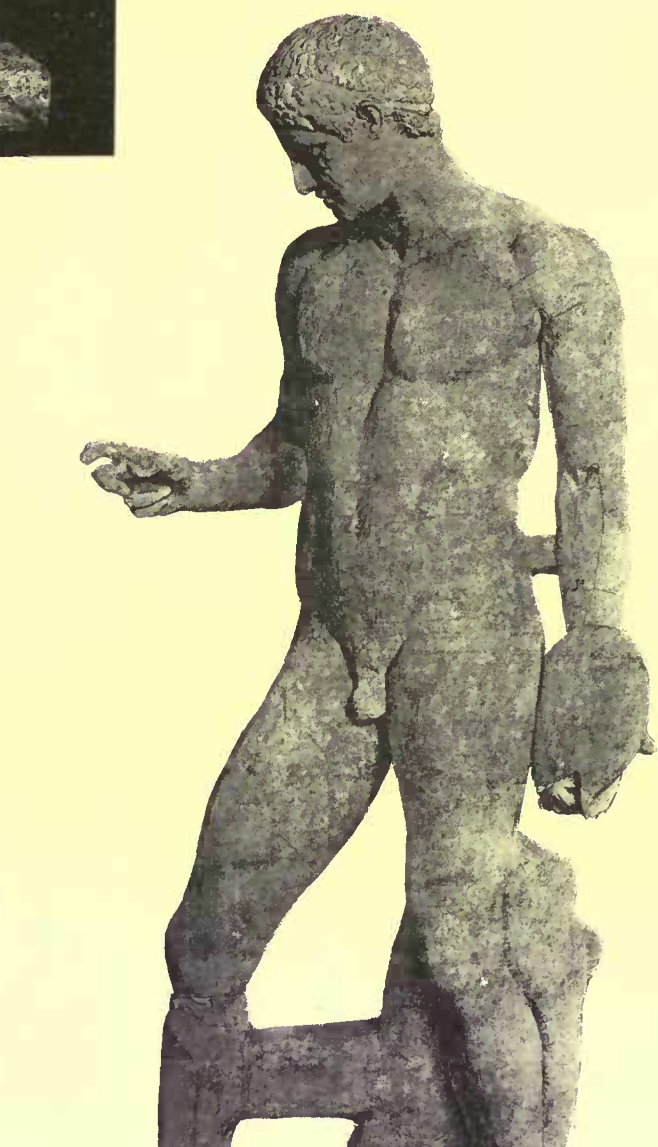


HELIOTYPE PRINTING CO. BOSTON


Sketch plan of end of bottom step
Base Mouldings of Pilasters on Front of Pulpit
Cap Mouldings of Pulpit
Plan of Under side of sounding board
Elevation of Pulpit in Seventh-Day Baptist Church Newport, R.I. Erected 1729
Restored 1884
George C. Mason Jr, Architect.

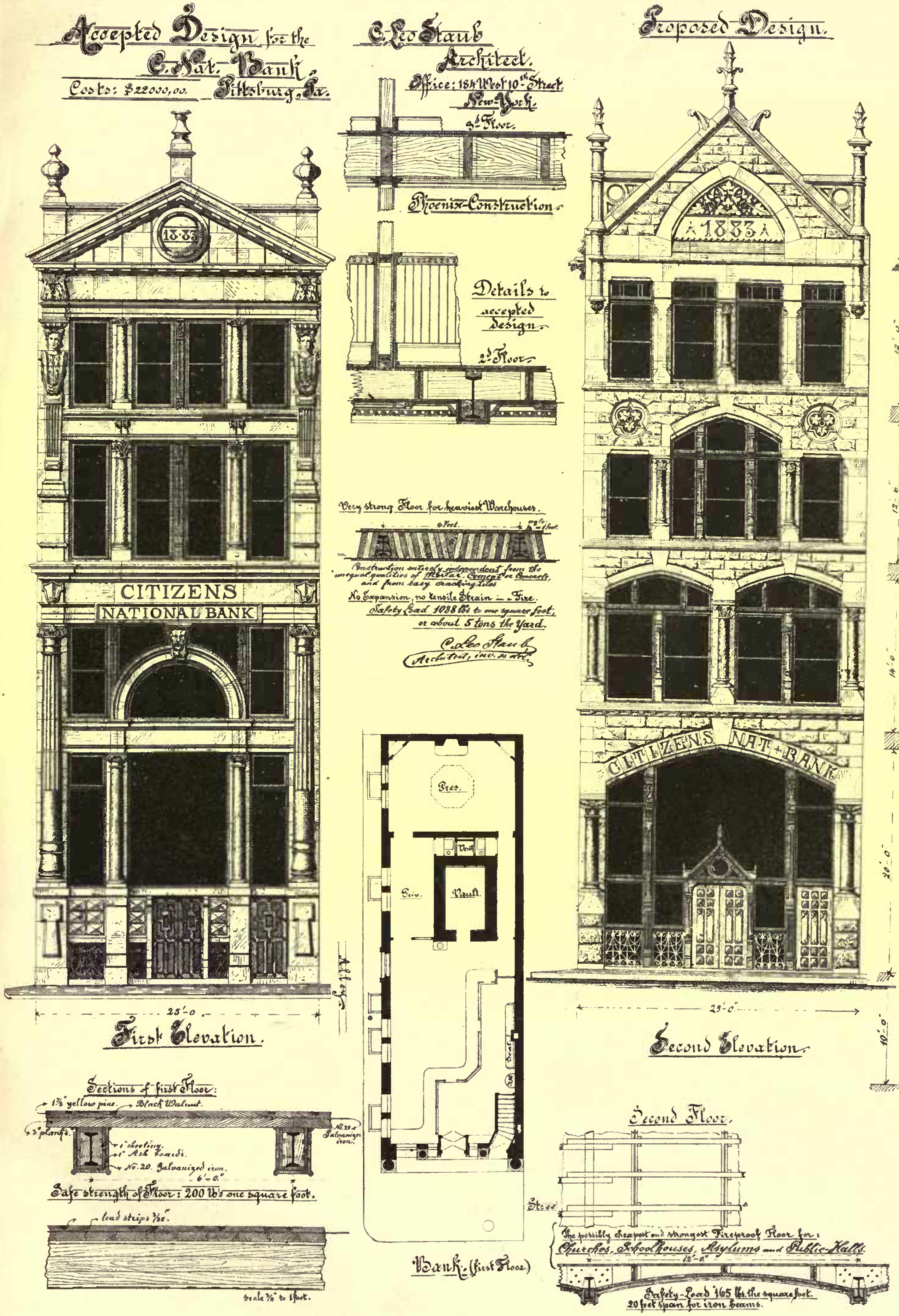

Section on line a—a
Restored 1884
George C Mason Jr. Architect.
Rail
Newel on landing
Sketches of the Two Newels and the Three Patterns of Balusters of the Pulpit stairs
Sketch of brackets on pulpit stairs
Sketch of plan of Shaft and Elevation of top of pillars supporting Gallery
Floor plan of Chapel
Line of gallery front
Scale for plan & section
Elevation of Gallery front
Center of pilaster
Plans, Elevations and Details of the SEVENTH-DAY BAPTIST CHURCH at Newport R.I. Erected 1729





HELIOTYPE PRINTING CO. BOSTON

The Discobolus of Naucydes.


Accepted Design for the
C. Nat. Bank,
Costs: $22000,00.
Pittsburg, Pa.
C. Leo Staub
Architect.
Office: 184 West 10th Street
New-York.
3d Floor.
Phoenix-Construction.
Details to accepted design.
2d Floor.
Proposed Design.
1883
CITIZENS
NATIONAL BANK
Very strong Floor for heaviest Warehouses.
6 Feet.
Construction entirely independent from the unequal qualities of Mortar, Cement or Concrete, and from easy cracking tiles
No Expansion, no tensile Strain in a Fire.
Safety Load 1088 lbs to one square foot,
or about 5 tons the Yard.
C. Leo Staub
Architect, inv. et del.
CITIZENS NAT. BANK
12' 0"
12' 6"
14' 0"
20' 0"
10' 0"
25' 0"
First Elevation.
Second Elevation.
Pres.
Vault
Sec.
Sections of first Floor:
1⅛" yellow pine.
Black Walnut.
3" plank's.
1" sheeting.
1" Ash boards.
No. 20. Galvanized iron.
No. 20 Galvanized iron.
6' 0"
Safe strength of Floor: 200 lb's one square foot.
lead strips 1/32".
scale ¾" to 1 foot.
Bank. (first Floor)
Second Floor.
Street
The possibly cheapest and strongest Fireproof Floor for:
Churches, Schoolhouses, Asylums and Public-Halls.
12' 0"
Safety-Load 165 lbs. the square foot.
20 feet span for iron beams.

James. The ceiling is also different, substituting for a simple barrel vault an elliptical and groined system of vaulting.

Whoever may have been its architect, the men who built Trinity Church, in 1724–25, also built the Sabbatarian Church, in 1729. It is not probable that an architect was employed for the latter edifice, but the section of every moulding and detail is the same in both, indicating the use of one set of hollow and round planes by the same hands. The designs of the galleries, piers and panelling are also the same. One feature in the Sabbatarian Church is, however unique; *i. e.*, the pulpit stairs. These stairs, although partaking of all the characteristic features of the best domestic work of the day, are richer in detail and are more delicately wrought than in any other staircase of the time, with which I am familiar. The staircase in Trinity Church is of a much simpler design, and the one in the Christopher G. Champlin house, the best domestic example in Newport, shows much less elaboration.

The panelling under the sounding-board of the Sabbatarian Church is the same as that on the ceiling over the warden's piers in Trinity Church, and the small pedestal on the sounding-board was surmounted by an English crown, probably of the same character as the one still remaining on the organ of old Trinity.

The tablets on the wall back of the pulpit, and shown on drawing, were presented to the Society by Deacon John Tanner, in 1773. The lettering is still clear and bright, with scrolls in the arched tops. Below the decalogue appears the following text from Romans III, xxxi: "Do we then make void the law through faith? God forbid; yea, we establish the law."

There is a legend that when the English army took possession of Newport, in 1777, and desecrated all the places of worship except Old Trinity and the Sabbatarian Church, by using them for riding schools and hospitals, the latter edifice was saved and guarded through respect for the decalogue and the royal crown found within its walls.

The clock, forming the initial cut of this article, hangs on the face of the gallery, between the two central piers, facing the pulpit. It was made by William Claggett, a celebrated horologist of his day in Newport. The clock in the tower of Trinity Church was also made by him, and many of the tall clocks, with sun, moon, stars and signs of the zodiac, frequently found in the possession of old families, bear his name. The church clock has been repaired and is again marking the hours, not of long and prosy sermons dealing with colonial brimstone, which seems to have been a very prominent article in the faith of our ancestors, but striking hour after hour the onward march of Newport's history, down from the eventful and romantic past, into the unknown future. GEO. C. MASON, JR.

COMPETITIVE DESIGN FOR STABLE NEAR PHILADELPHIA, PA., BY "*Nyphte*."

FOUNDATIONS, 36 perch good local stone, rock-face, cement-pointed joints,	$167
Framing and outside boarding, first floor,	155
Framing and outside shingles, second floor, 300 feet,	35
Slate roof, painted tin flashings and ridgings,	170
Mill-work, complete,	150
Carriage-shed, planed timbers in roof,	95
Outside finish, barges and mouldings,	21
Joists and flooring for first and second floors,	110
Inside board lining, stable (without stalls),	23
Inside board lining, coach-house,	12
Stairs, $15; harness-closet, $15; feed-bins, $14,	44
Hardware, iron bars, complete,	65
Carpenters' work (all extras included),	225
Painting, two coats outside; two coats *oil* inside,	70
Plastering, coach-house,	12
Plumbers' work, complete, without trough,	54
Heating work, stove and sheet-iron to protect walls,	15
Galvanized-iron ventilator, tinning same and smoke-pipe,	38
Brick floors, with flagstone on edges,	25
Architect's fees (a Christmas present),	00
	$1,435

GERMANTOWN, PHILA., December 6, 1884.

"*Nyphte*," ARCHITECT: —

Dear Sir, — I propose to build the stable as per plans and specifications, for the sum of fourteen hundred dollars.

Respectfully yours, GEORGE HEARST.

My figure is $1,435; Mr. Hearst gave me the estimate for $1,400 before I introduced the brick floor and inside lining for the stable and coach-house.

CITIZENS' BANK BUILDING, PITTSBURGH, PA. MR. C. LEO STAUB, ARCHITECT, NEW YORK, N. Y.

THE present bank building is to have a new front, and three new stories above for offices, while it brings no rental income now, the second story being an empty room which was only built sixteen years ago to give a protected ceiling-light for the banking-room. The materials for the front, which is designed to admit all possible light and at the same time to keep off the street sight, are dark Quincy, Mass., granite for the general architecture, flush surfaces polished, and polished column-shafts of red granite from Iron Mountain, Missouri. Two 15-inch rolled-iron beams support the upper parts of the front in both designs. Cast-iron door-casings and hardwood finish and window-frames. Mahogany for the banking-room and black walnut for the upper stories. The floors and ceilings are constructed as per detail drawings, C. Leo Staub's "Phœnix-Construction" being adopted throughout for its economy and adaptability to building as quickly as possible, and will render all the fire-proofing and water-proofing desired. (See description in the *American Architect* for February 7, 1885.)

THE MINAR OF KOOTUB, INDIA.

"THE minar is 48′ 4″ in diameter at the base, and, when measured in 1594, was 242′ in height. Even then, however, the capital was ruined, so that some 10 or perhaps 20 feet must be added to this to complete its original elevation. It is ornamented by four boldly projecting balconies; one at 90, the second at 140, the third at 180, and the fourth at 203 feet from the ground; between which are richly sculptured raised belts containing inscriptions. In the lower story the projecting flutes are alternately angular and circular, in the second circular, and in the third angular only; above this the minar is plain, but principally of white marble with belts of the red sandstone of which the three lower stories are composed."— *Fergusson.*

We are indebted to Mr. T. O. Hague of New York for the photograph from which our illustration is copied.

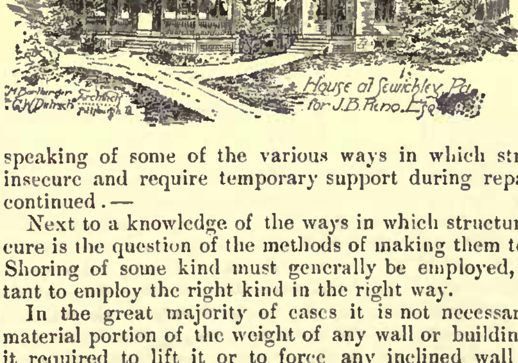
THE DISCOBOLUS OF NAUCYDES.

FOR description see article elsewhere in this issue. The small Discobolus, a reproduction of a cast from a bronze statuette in the Berlin Museum, gives with distinctive variations of its own the attitude of the familiar Discobolus of Myron.

THE LEANING TOWER, SARAGOSSA, SPAIN.

As to other leaning towers, so to this attaches the legend that its inclination was intentional, but the proofs to be found in the window-jambs, in the floors, the stairs, to say nothing of the crushed brick, show that as in other cases the inclination here is due to faulty foundations. This tower, in style a mixture of Arab and Gothic art, stands near the centre of the city in front of the church of San Filippe. It was begun in the reign of Ferdinand II by the engineer Gabriel Gombao, and was finished in fifteen months, about 1506, and as the structure is of brickwork of much elaborateness, rising to a height of about 270 feet (83m.), it is not surprising that the lines of the building are not as straight as they might be, although the foundations are laid to a depth of about 52 feet (15m.84). The diameter of the octagon at the base is about 42 feet (12m.73). A spiral staircase, winding about the staircase-well, which in 1857 was filled up with masonry to prevent the fall of the entire tower, gives access to the top. The amount of the inclination, which is most apparent from the south side of the city, was in 1741 nearly nine feet (2m.69). At present the inclination appears to begin about 15 feet from the ground, though this is probably due to the base having been rebuilt in 1857, and consequently being still quite plumb. At about two-thirds of the height the tower again returns to the perpendicular. It is so easy a matter for a photographer to distort the inclination of a building of this kind that little reliance can be placed on photographs — the one from which we copy our illustration among the number.

THE SHORING OF BUILDINGS.



THIS was the subject of the fourth of the "Free Lectures on Matters connected with Building," delivered under the auspices of the Carpenters' Company. The lecture was given by Mr. Thomas Blashill on the 4th ult. After speaking of some of the various ways in which structures become insecure and require temporary support during repair, Mr. Blashill continued. —

Next to a knowledge of the ways in which structures become insecure is the question of the methods of making them temporarily safe. Shoring of some kind must generally be employed, and it is important to employ the right kind in the right way.

In the great majority of cases it is not necessary to carry any material portion of the weight of any wall or building. Still less is it required to lift it or to force any inclined wall back into the upright. These last are operations of a very special and exceptional kind. We generally want to stop the present mischief by providing some firm and sufficient resistance to any continued tendency towards falling over. The following headings will cover all these cases: —

1. The flying-shore, which carries no weight, but is generally a trussed beam, placed horizontally between two buildings in order to prevent one or both of them leaning over the vacant space between them.

2. The raking-shore: an inclined prop also used to keep a wall from falling outwards, but which will carry some dead weight if applied very carefully for that purpose.

3. The strut, or dead-shore, used only for carrying weight, and generally placed under bressumers or floors.

4. The needle: a shortbeam supported at the ends by struts and used to carry a short length of walling.

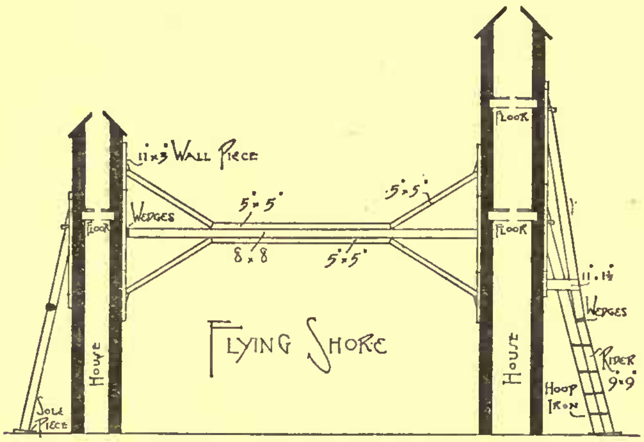
5. Framed systems of shoring and centering used under arches to carry the dead weight of heavy structures during the rebuilding of piers.

6. Shoring used in combination with some mechanical power for forcing walls back into an upright position.

In using any of these contrivances we cannot be too much impressed with the necessity for proceeding gently, so as to avoid all jarring or shock to the building. Shoring is not an affair of sledge-hammers, but should be quietly put in its place and made tight up to its work with wedges, so as not to injure the structure. It should also be fixed so that it can at any time be eased, and finally removed without any violent shock; and, lastly, it should be so arranged that it will be well out of the way of any work that has to be done while it is in its place.

A flying-shore (see diagram) is the best contrivance for preserving the position of a wall that is simply in danger of falling over. The assistance that such a wall requires is usually extremely slight. A horizontal beam is fixed across a street or across vacant ground, each end being carried on a short piece of wood that goes through a plank which is fixed upright against the wall. The beam is braced against these two pieces and has straining-pieces secured to it, to form abutments for the braces, which are stopped on the wall-pieces by cleats. The beam is tightened up at one end by wedges. We shall see how all these parts are used in relation to the raking shore.

Flying-shores can be made of ordinary timber up to a span of between thirty feet and thirty-five feet; for longer spans timber of

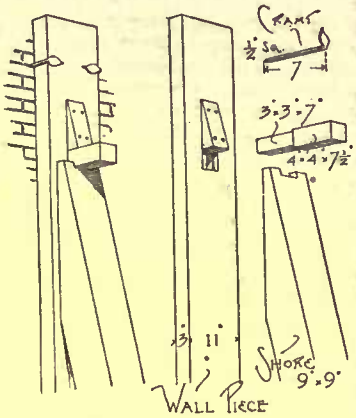


extra length must be used, or the beam must be scarfed. In such cases, great care is necessary to stiffen the beam and to wedge it tight, but flying-shores can be supported and stiffened by connecting them to others above or below them or at a few feet distance, or by taking upright posts up from the ground. When the shore has to be removed, the wedges can be loosened, and the upper braces taken away for a few days if it is desirable to test whether the building has been made secure by the works that have been done to it for that purpose.

A flying-shore placed across a street is usually put to support one house against an opposite house that is supposed to be firm. But when deep excavations are being made in the street the houses on both sides may be supposed to require support from each other, and this is the case when one house in a row has been taken down and the houses left on each side of the gap require mutual support. It is often supposed that the flying-shore should be made stronger, — perhaps twice as strong, — when both houses incline to fall as when only one of them is inclining. But, if each house is exerting a thrust equal to one ton against the shore, the one will simply counteract the other, and the strain upon the beam will be the same as if one house only was pressing with the force of a ton against another house that was standing firm.

In considering the raking-shore, we will go back to the illustration which Professor Kerr gave us of the relation between the beam and the truss. If we have a beam that is fully loaded in the centre we may draw two lines from the point where it is loaded to the two points of support, and if we remove the two upper gusset-shaped pieces outside these lines, the beam will still carry its load. If we remove the remaining substance of the beam, except these two lines and the bottom line, and make the three lines strong enough, we have two rafters in compression and a tie in tension, and these will carry the load. If we provide two good abutments and remove the tie, the rafters alone will carry the load. We will now go a farther and final step and remove one of the rafters, — that which remains is a raking-shore. In order that it should support even the smallest load, it is necessary that, in addition to the abutment at the base, it should have some sufficient resistance at the top to supply the place of the opposite rafter. If there is no such resistance, the load will bring the shore down, describing a curve struck from the foot of the shore. There must first be something to shore from; and, secondly, something to shore to. What such a shore will carry when properly arranged may be accurately calculated according to its degree of inclination. It will carry most weight when it slopes least.

As a matter of practice, the raking-shore is not generally used to carry heavy weights, but to afford such moderate support to a wall or building as may resist its tendency to incline out of the upright.



Heavy weights are carried by dead shores and needles. The first thing is to get a solid foundation to start from. If the ground is soft or loose it may be rammed; if very bad, a floor of plank or stout timbers may be laid down. If vaults or areas exist close to the outer face of the wall, you plant your shore beyond them, or go down to the bottom of them, or use any solid wall you may find between them. When a wide excavation for a sewer is being made in a street, the houses may be shored from whole timbers laid across the street, as well as by flying-shores from house to house. It is generally sufficient to take up a part of the paving and lay the sole-piece on the ground below it with the necessary inclination towards the building.

It used to be the practice to merely plant as many single shores or props as seemed necessary in the ground, to insert the upper ends for a few inches in the parts of the wall that seemed to need them, and to wedge them tight into these holes. The present practice is to observe the part of a wall that needs a shore (or if the whole wall be inclining, to fix on several places a few feet apart), and there to put up shores, as I shall describe.

I have said that you must have something to shore to. Such defective walls as we constantly see are not fit to have a prop put to them in any careless way. For, if the wall is settling and continues to do so — ever so little — after a raking-shore is put, the shore, having no firm resistance at the top to supply the place of the opposite rafter, will be brought down by the weight and will push in the wall. The more the shore slopes out of upright the greater is the danger of this accident. I have seen it happen to one of the unbonded nine inch walls that I have described, which fell inwards upon the chamber floor and the shore after it.

When a flying-shore is made to incline so that its foot comes down on a lower building the danger of injury to the lower building is very considerable.

The safest place for fixing a raking-shore in front of a building is against the end of a party-wall, where most old buildings are insufficiently bonded. There the party-wall gives the necessary resistance, and the same may be said of other cross and return walls. If the part to be supported is between such returnwalls, the points of support must be fixed near to the under side of the floors, which will offer sufficient resistance.

The mode now adopted for applying the shore to the wall is to provide a long plank, called a wall-piece, fixed upright against that part of the wall which needs support. Pieces of wood, called pins or joggles, are passed through the plank and made to project four inches into the wall, a half brick being removed at each place where the head of a shore is to come in order to admit the joggle. The wall-piece must be carefully fitted to the face of a wall that has strings or other horizontal projections, by packing or otherwise.

It is usually necessary to put more than one shore from the same sole-piece, so that as many as three or four may be made to support the joggles at different heights of the wall-piece. The outer ones may be fixed as "riders" carried on short pieces of timber. Thus, instead of propping a wall at irregular points by several shores having independent foundations, and acting independently against the wall, we have one strongly-framed compound shore, which may be repeated at intervals in the length of the wall as may be required.

As to the manner of fixing: the shore, having been cut to fit in its place, is set on the sole-piece, and the top, which has been cut with a couple of horns to clip the head of the joggle, is brought up to it. It is dangerous to drive up the foot of the shore with a big hammer, as that would certainly give severe shocks to the building, and probably make the shore too tight. It requires to be just brought well up to its place, and no more; with this object a crow-bar is put into a notch cut in the heel of the shore, and it is thus gently levered up until it is felt to be tight. It can then be secured by iron dogs, so that, should the shore become slack, or be subjected to any shock, it may remain fixed at both top and bottom.

In fixing a rider the short piece of timber to form the foot is first set on the sole-piece so as to lie against the back of the shore; the rider is next made to rest on a pair of oak wedges, and is gently brought up so as to clip the joggle by driving the wedges. The feet of the shores are fastened together by hoop iron, which is wrapped round them and well nailed; if necessary the foot of the outer shore might be cut with a very short tenon and dropped into a mortise in the sole-piece. It is the common practice to connect the rider and the shore by nailing stout boards in one or more places across each

side of them, which are continued to the wall-piece, the whole system thus becoming a strong piece of framing in a triangular form. Solid timber might be used instead of the boards, but these are easily fixed and are sufficient for ordinary cases. The cleat that is put above the joggle should be very securely fixed, and may be let into the wall-piece if much strain is expected. It is usually nailed and, practically, has very little to do.

As to the dimensions of timber used in shoring, there is a common practice of using deals, which, from their thinness, bend sidewise as soon as any weight comes upon them. When half-timbers are used there is loss of strength from the same cause. Die-square stuff five inches by five inches to nine inches by nine inches is the best material for shoring, particularly as there is much chance of accident from a side blow or from the pressure of wind.

Fir is the best timber to use, on account of its straightness of grain, cheapness, and lightness when being moved.

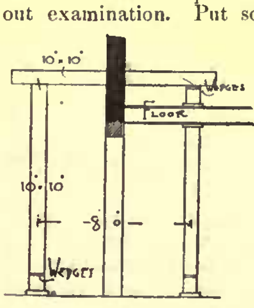
The way in which raking-shores may be employed to carry dead weight is shown in the operation of removing a column from the arcade of a church. The shores, two or four in number, and perhaps used together with struts and needles, are placed opposite to each other, so that the indirect action of each of them against the part supported may be counterbalanced. In Viollet-le-Duc's "*Dictionary of French Architecture*" some examples of this are given.

The action of raking-shores is a question which those acquainted with mathematics may study with advantage. The whole question of shoring and underpinning has recently been dealt with in a book published by Batsford, High Holborn, price 4*s*. 6*d*. It was written by the late Cecil Haden Stock, an earnest student in architecture, who managed to do this very useful piece of work at an unusually early age.

The various ways in which the dead-shore or strut is useful need not be catalogued. As a temporary support for girders during the rebuilding of a wall, or during the replacing of a column, it is in common use. I have seen such struts fixed by simply driving them into their place with a sledge-hammer, which very seriously shakes a building. They should be wedged up at the bottom, driving the wedges very gently, and stopping as soon as the strut is made tight. The timber should be solid and sound. One sometimes sees three or four deals lashed together, and made to do duty as a strut. It should be better known that the strength of a column or strut depends very materially on its thickness or diameter, and that three deals, however firmly you may fix them together, are very far short of the stiffness of a post of solid timber of the same dimensions. The utmost care must be taken to see that the strut is set on a solid foundation. A soft subsoil, old vaults, or cesspools must be searched for, and a good sill of timber used to start from.

We now come back to our old friend the beam, pure and simple. The "needle" is a short beam loaded at the centre, and usually carried at each end by a strut. It should be of good, sound, and solid timber, and if it is ever necessary to use a combination of deals, they should not be laid flat upon each other (as is often done), but placed edgewise, bearing in mind that a nine-inch by three-inch deal so placed is three times as strong as the same deal laid on its side. Wrought-iron rolled joists are now very often used as needles, for they only require a hole of four inches in width, instead of ten inches or a foot.

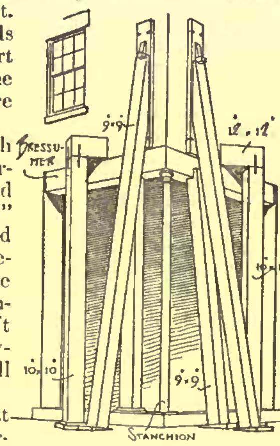
You first strut up the floors, not trusting to the bottom floor without examination. Put some timber in the window openings, and support any balconies or projecting parts. Raking-shores are then put to steady the upper part of the house, and the needles are passed through holes under the solid parts of the walling. If any of the struts cannot be fixed sufficiently near to the front the needles must be made longer, and stiffened by strong raking-pieces from the foot of the struts. The bressummer is then passed into its place, bedded, and the brickwork over it made good in cement.



It is often necessary to make a large opening in a front or cross wall, high up or in a position where struts cannot be easily fixed. Then a number of square frames may be made, best of iron, consisting at top and bottom of short needles joined by uprights at the ends. These are put through the walls in the place of ordinary needles, the bottom pieces resting on the brickwork, the tops pinned up tight to the wall above. The brickwork along the wall is then cut away of depth sufficient to admit the girder, and after it is made right the frames may be removed and the wall below may be cut away to form the opening. In the same way an arch may be turned over an intended opening by making the temporary frames of height sufficient to suit the rise of the arch. There is a good illustration of this plan in the *Builder* for 1859.

In order to place or to change the column at the angle of a building, a needle is put through the corner diagonally with other needles and raking-shores, of which two should stand close to the corner. When a raking-strut is put under a bressummer, catching it with a bird's mouth, remember that there is the same danger and need of good resistance at the top, as in the case of a raking-shore, and that the more nearly upright the strut is the safer and stronger it will be.

Whether the formation of an extra basement beneath a building shall be a dangerous or a safe operation depends chiefly on the way in which the shoring is arranged and maintained during the work of underpinning. The most obvious course is to secure the walls of all adjoining buildings by flying-shores and by raking-shores planted on the old level of the ground, *deferring the excavation until the underpinning is completed*. This is executed in lengths of about four feet by sinking shafts at intervals along the face of each wall and needling all parts that require it. The mass of earth that has afterwards to be excavated is thus made to support the shoring and the timbering of the shaft until the adjoining buildings are made secure.



A party-wall, the lower part of which was split and ruinous, had to be underpinned, and raking-shores were applied to it. These stood upon soft "made" ground, with a trench close behind them, another trench being made between the shores and the wall for the purpose of underpinning. In that condition of insecurity the wall was left with the rotten work cut out and several courses of underpinning left still undone from Saturday to Monday.

You may be surprised to hear that no accident happened, — more surprised, perhaps, that I tell this story, — for, if it proves anything, it proves that such work will stand. I am sometimes met by a man whom I have warned for doing something of this kind with the triumphant announcement that nothing has happened. One can only reply that it ought to have happened, and this leads me to make the following observation. There are many things done in dealing with old buildings which may or may not be dangerous, — one can only judge by the result. The thing is an experiment. What shall we say of it? I say it is risky. Let me offer that most useful word for your careful consideration. I do not find it in the dictionary, yet I can count over twenty words in the column where it ought to be that will never be of the least use to any of us as long as we live!

It is never worth while, for the sake of a saving in trouble, or even in cost, to run risks that are plainly to be seen. All prudent constructors go a great deal farther than that. From a sense of risks that are not obvious, or that may only arise at a distant time, we usually make all kinds of beams strong enough to carry three or four times the greatest weight they are expected to bear. Columns are made of ten times the strength that might seem to be necessary. Provision is thus made for contingencies, and yet accidents sometimes happen in spite of this caution. — *The Builder.*

THE DENVER CAPITOL COMPETITION.

CLEVELAND, O., April 23, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Gentlemen, — You have probably seen a copy of the "Notice to Architects," issued by the Board of Capitol Managers, Denver, Colorado. In view of the stand taken by your paper recently on such munificent offers, it may be of interest to you to see at least one answer to this circular. We trust they will receive many such. The following is a copy of our letter to them. Use your judgment as to its use. Very respectfully, EISENMANN & BLUNT.

April 21, 1885.

TO THE HONORABLE BOARD OF CAPITOL MANAGERS, DENVER, COL.: —

Gentlemen, — A copy of your "Notice to Architects" has just been received. We beg leave to state that we consider it, like many others emanating from similar Boards, a fine bit of satire as well as slightly impertinent. The terms offered are such that no architect of standing and self-respect can enter the competition. The successful man is offered $1,500 for work for which our customary charge is 2½ per cent on the contract price, or in this case $25,000! The total offer is $26,500, or a little over 2½ per cent, for the responsibility of the expenditure of $1,000,000, aside from the large expense attendant on five years' supervision and drafting of all plans and specifications. A commercial man would laugh such an offer to scorn. Why should a professional man do otherwise?

Very respectfully, EISENMANN & BLUNT.

THE PROPER COMMISSION ON ALTERATIONS.

LANCASTER, PA., April 10, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Gentlemen, — I have prepared plan, elevation, details, and made all necessary measurements for the remodelling of a store front in this city; I had no superintendence of the work. The probable cost is $750. Please state what per cent commission I should receive on such work, as endorsed by the American Institute of Architects.

Very truly yours, C. E. URBAN.

[The American Institute of Architects leaves the rate of compensation to architects for work costing less than ten thousand dollars to be fixed by the parties themselves. Many architects have a printed schedule of their own fixing rates for small commissions, which, in such a case as this, would probably average about twenty per cent on the cost for full service, with twenty-five to fifty dollars additional for making measurements. If

superintendence were not given, three-tenths of the fee would be deducted. — Eds. American Architect.]

PHILADELPHIA'S BUILDING AND REAL ESTATE OUTLOOK.

To the Editors of the American Architect: —

Dear Sirs, — The outlook for the building interests in Philadelphia and surrounding section is encouraging and satisfactory, and the prospects are excellent for a continued improvement as the season advances. Not for some time have the chances been so favorable for good and profitable business. The transactions in real estate have, since the opening of spring, been quite heavy. The volume of trade has been especially large in the northern and northwestern portions of the city, where extensive architectural operations are being developed, clearly indicating a prospective increase in the number of new houses as soon as the weather will permit the commencement of construction. The financial consideration of the real-estate transfers recorded in the Philadelphia Recorder of Deeds office from January 1 to the same period in March amounted to $3,337,000, while during the latter month additional transfers increased the amount to $4,262,000, thus exhibiting a vast real estate business. Other important transfers, that are sure to be negotiated before the building season is inaugurated, will swell the sum to the enormous figure of $7,000,000, one investment that is to be placed some time in May aggregating over a million dollars.

Capitalists and builders have schemes partially mapped out for the erection of an immense number of new dwellings during 1885, and it is confidently believed that, with the exceedingly cheering prospects for trade, and the low prices governing materials, there will not be an idle mechanic in Philadelphia and the suburban districts by the first of July next. The prominent builders, architects, and other operators who depend on the building industry for support, are actively preparing for the advent of the promised good times, and, so nearly perfect are their arrangements, that but little remains to complete the plans satisfactorily. It is possible that all classes of mechanics, carpenters, bricklayers, masons and plumbers will receive an increase in compensation, and it is certain there will be no cutting down in the wages of general laborers. These statements are based upon information obtained from those who are thoroughly well posted upon the situation, and are considered competent authority. Contrary to all reports, there is not the remotest possibility of any aggressive labor movements being engineered, and which might interfere with, and retard, building operations.

Interviews with representative constructors have developed the fact that several thousand houses, ranging in size from eight to twenty rooms, and supplied with every modern convenience, will be built. Besides these, there will be erected several French flats, numerous special buildings, several churches of magnificent proportions, and half a dozen or more public institutions, among which the Taylor College for Women, to be constructed at West Philadelphia, will be an imposing and model edifice. The architecture of the dwellings will be very handsome and elaborate, surpassing in beauty of design anything that has previously been attempted in the Quaker City, the architects employed for the work being among the most celebrated in the country. The peculiarly ornate decoration of the first-class houses in the fashionable centre of Philadelphia is rapidly enhancing values, and, consequently, there is a great and commendable rivalry among architects and builders to exceed each other in the displays and beautiful adornments. W. A. E.

THE ARCHITECTS OF W. H. VANDERBILT'S HOUSE.

New York, April 11, 1885.

To the Editors of the American Architect: —

Dear Sirs, — We notice in your number of to-day, page 178, that you name as architects of Mr. Wm. H. Vanderbilt's house Messrs. Atwood and Snook.

It is a matter of record, and we supposed it to be very generally known that Herter Brothers were the architects of that building, and are the only persons responsible for the designs, both of the exterior and the interior.

For further information we might add that of the two gentlemen named by you, Mr. Atwood was employed by our firm at that time as a draughtsman, and Mr. Snook by Mr. Vanderbilt as general superintendent.

Hoping you will have the kindness to make this correction, we are Yours truly, Herter Brothers.

[We presume that our reason for saying that Messrs. Atwood and Snook were the architects of this house was very similar to the reason which caused Messrs. Herter Brothers to take out the building permit in the name of these gentlemen. — Eds. American Architect.]

BOOKS ON DETAIL DRAWINGS.

New York, N. Y.

To the Editors of the American Architect: —

Dear Sirs, — Would you let me know through your paper the text-book for in and outside detail drawings for country houses? Also, a good book for interior arrangements for factories, breweries, gas-factories, etc.

I shall be very much obliged to you if you can advise me.

Yours, D.

[W. T. Comstock, 6 Astor Place, New York, can probably furnish you with as good books on detail drawings as are published in this country. We know of no books on factory and brewery planning. — Eds. American Architect.]

CRITICISING THE WORK OF YOUNG ARCHITECTS.

Savannah, Ga., March 20, 1885.

To the Editors of the American Architect: —

Dear Sirs, — It has occurred to me that you might materially assist many of the younger members of the profession, who are subscribers to the *American Architect*, by giving them, through its columns, the benefit of professional criticism upon their efforts. To this end I would propose that you invite the younger or "weaker" members of the profession to submit to you their designs, that you examine and give through your paper a brief criticism, setting forth the merits or shortcomings of the same. Should any of the drawings be deemed worthy of reproduction, they could be published, if you saw fit. I would have particular stress laid upon the architectural merit of a design rather than upon the draughtsmanship.

I think thus, without taxing your time or patience too much, you could do a great deal towards extending a helping hand to a certain class of your subscribers.

At the South, generally speaking, the architect is not sought after as is the case at the north, and as a result there is not the same opportunity offered to the young men in the profession for self-improvement as elsewhere.

A little competent criticism will do much towards pointing out the right way. Should the number of designs submitted prove too great a tax upon your good nature, a small fee to be charged for the services rendered would reduce it, while at the same time it would not prove a barrier to those who wish to be benefited by your criticism.

Very truly, W. B. W. Howe, Jr.

[This letter contains the germs of an idea to which we have sought frequently a way to give effect, but without success. We often wish we could be accorded the privilege of publishing real criticisms of many of the designs which are now put forth without a word to show why they are not as good as the best, and so given a currency which is flattering to the author, while it is not the best thing for the art. It would be unprofitable in every sense to publish criticisms for the benefit of an individual, as would be unillustrated remarks, and it would be a dangerous experiment to use any of our present illustrated pages for the purpose of explaining that a certain design was indifferent, poor, impossible or atrocious. As for playing the part of private mentor, we have neither time nor inclination. — Eds. American Architect.]

A BOOK ON STEAM-HEATING.

Cincinnati, O., April 27, 1885.

To the Editors of the American Architect: —

Dear Sirs, — You state in your paper to write to John Wiley & Son for W. J. Baldwin's "*Steam Heating for Buildings, or Hints to Steam Users.* Where are they? You do not say.

H. T. Duke & Co.

[Address John Wiley & Son, 15 Astor Place, New York. — Eds. American Architect.]

AN EXPERT IN LIGHTNING-RODS.

Albany, N. Y., April 22, 1885

To the Editors of the American Architect: —

Dear Sirs, — Will you kindly give me the names and addresses of the professionally expert in the putting up of lightning-rods?

Yours truly, Y. T.

[Read Spang's "*Practical Treatise on Lightning Protection*," published by Van Nostrand, New York, and be your own expert; or address Henry W. Spang, Reading, Pa. — Eds. American Architect.]

SARACENIC ARCHITECTURE.

Providence, April 14, 1885.

To the Editors of the American Architect: —

Dear Sirs, — Is there any work in existence that treats of the "Saracenic" style as distinct from the usual Oriental treatment?

Yours truly, H. B. Ingraham.

[Knight's "*Saracenic Remains*," which illustrates the work of the Normans in Sicily, is a somewhat rare work. — Eds. American Architect.]

NOTES AND CLIPPINGS.

Another Name for Zoan. — Another name has been added to Zoan. Mr. Petrie has identified it with Avaris, the stronghold of the shepherd kings, 3,500 years ago! So now we have Avaris, Zoan, Tanis, San. We have seen a photograph of the monumental proof, just from Mr. Petrie's hands. — *Boston Transcript.*

Hours of Labor on the Continent. — A committee of the Société Industrielle de France was recently appointed to consider the feasibility of shortening the hours of labor in the textile and collateral industries. At present the hours throughout France are rarely, if ever, under twelve per day, while in Germany they are still longer, being thirteen at Dusseldorf, thirteen to fifteen at Treves and Aix-la-Chapelle, and even sixteen in Franconia — this, too, without deductions for Sundays and holidays. After mature consideration, however, the committee have come to the determination that it is impossible to recommend the reduction, in face of the great competition from England and Germany, which shows clearly enough that it is upon low wages and long hours, no less than the advantages of an excellent system of technical education, that France depends for her success in competition with England in the industrial markets of the world. — *Cabinet Maker and Art Finisher.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

315,815. DRIVE-WELL POINT.—Miles H. Morris, Chicago, Ill.

315,818. STEAM RADIATOR AND HEATER. — Thos. M. Morton, Pittsburgh, Pa.

315,822. KILN FOR BURNING BRICKS. — John O'Brien, Turner's Falls, Mass.

315,836. VAULT-COVER. — John Raynald, Philadelphia, Pa.

315,838. BURGLAR-ALARM. — William H. Reiff, Philadelphia, Pa.

315,839. SET-SCREW. — Frank A. Reiher, Chicago, Ill.

315,845. LATCH.—John R. Scott, Chicago, Ill.

315,849. BRICK-MACHINE.—Peter L. Simpson, Minneapolis, Minn.

315,861. WINDOW-BLIND SLAT-FASTENER. — John M. Van Dyke, Washington, N. J.

315,902. PLASTERING, CALCIMINING AND PAINTING MACHINE.—Theodore H. Brown, Viroqua, Wis.

315,912. APPARATUS FOR COLLECTING AND DRYING THE SEDIMENTARY MATTER OF SEWAGE. — Robert Corscaden, Providence, R. I.

315,930. CONSTRUCTION AND PRESERVATION OF SHINGLE ROOFS. — Henry W. Gates, Kennedy, N. Y.

315,9[illegible]6. PLASTER COMPOUND. —George L. Gregory, Marion, Iowa.

315,958. SKYLIGHT. — Bernard Overman and William H. O'Connor, Washington, D. C.

315,96[illegible]. STONE-DRESSING MACHINE. — John B. Ross, Rahway, N. J.

315,970. HYDRAULIC ELEVATOR FOR BUILDINGS.— Allan Stirling, New York, N. Y.

315,977. ROOFING FOR BUILDINGS AND OTHER STRUCTURES.—Seth G. Tufts, Maineville, O.

315,999. ALARM FOR SHOP-DOORS. —Antoine Bénézit, Villeneuvesur-Lot, France.

316,037. DOOR-HANGER. — Hiram A. Holmes, Epsom, N. H.

316,050. DUMB-WAITER. — Wellington B. Moyer, Reading, Pa.

316,055. STEAM-RADIATOR. — John B. Pierce and Joseph Bond, Buffalo, N. Y.

316,056. STEAM-RADIATOR. — John B. Pierce, Buffalo, N. Y.

316,057. COMBINED WASTE AND OVERFLOW-VALVE.—William A. Piet, Glenbrook, Conn.

316,070. HYDRAULIC ELEVATOR. —Henry F. Shaw, Boston, Mass.

316,079. PLANE. — Justus A. Traut, New Britain, Conn.

316,[illegible]83. WALL-DECORATING MATERIAL. — Oliver E. Vail, Chicago, Ill.

316,098. LATCH AND LOCK COMBINED. — Edwin R. Wethered, Woolwich, County of Kent, Eng.

316,110. SEWER-GAS TRAP. — Russel H. Beckwith, New York, N. Y.

316,115. LOCK FOR SLIDING-DOORS.—Geo. Cassady, Valley Springs, Dak.

316,131. SHUTTER-WORKER.—Alvin H. Dodd, Hudson, N. Y.

316,132. LOCK. — John W. H. Doubler, Rockford, Ill.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report sixty permits have been granted, the more important of which are the following: —

S. Frank, five-st'y brick warehouse, n s Baltimore St., between Howard and Eutaw Sts.

J. H. Lee, three-st'y brick building, s e cor. North and Chase Sts.

T. S. Wellenger, three-st'y brick building, n e cor. Chase and Ensor Sts.

C. Nicolaus, three-st'y brick building, n s Biddle St., w of Wilcox Alley.

J. G. Bramble, 11 two-st'y brick buildings, commencing s w cor. Patterson Park and Fairmount Aves.

H. R. Curley, 10 two-st'y brick buildings, e s Scott St., n of Ostend St.

W. J. E. Dixon, 6 two-st'y brick buildings, commencing n w cor. Payson and Marianna Sts., and 7 two-st'y brick buildings, n s Marianna St., w of Payson St.

S. D. Price, 2 two-st'y brick buildings, w s Peabody St., s of Preston St.

Lentz & Lingerman, 2 three-st'y brick buildings, w s Hanover St., between Clement St. and Fort Ave.

J. B. Harig, three-st'y brick building, s s Hill St., between Charles and Hanover Sts.

P. Hanrathy, three-st'y brick building, n e s Richmond St., between Park and Tyson Sts.

Jos. Parson, 9 three-st'y brick buildings, n s Chase St., e of Greenmount Ave.

W. J. H. Gluck, three-st'y brick building, w s Gay St., between Front St. and the Falls.

A. S. Clayton, 2 three-st'y brick buildings, w s Vincent Alley, n of Baker St.

Adolph Storck, three-st'y brick building, w s East St., between Ensor and Hillen Sts.

J. G. Gehring, 2 three-st'y brick buildings, w s Gay St., between East and Chestnut Sts.

Emil Gail, three-st'y brick building, w s Gay St., between East and Forrest Sts.

Michael Dundon, three-st'y brick building, e s Light St., between Warner and Montgomery Sts.

United Brethren Church, 3 three-st'y brick buildings, s s Perry St., between Sharp and Hanover Sts.

Chas. F. Muller, three-st'y brick building, n w cor. Haw and Emory Sts.

Henry Westphal, 9 two-st'y brick buildings, w s Byrd St., s of Barney St., and 10 two-st'y brick buildings, w s Patapsco St., between Heath and Barney Sts.

T. Carter, 6 two-st'y brick buildings, s s McHenry St., commencing s w cor. Norris Alley, and 2 two-st'y brick buildings, w s Norris Alley.

A. Hanneman, 12 two-st'y brick buildings, n s Hanneman Ave., between Ann and Wolfe Sts.

Edw. Key, 16 two-st'y brick buildings, n w s Washington Road, commencing at Stockholm St.

H. Dolman, 6 three-st'y brick buildings (square), n s Smyth St., commencing n e cor. Myrtle Ave.

Wm. B. Whiteside, 3 three-st'y brick buildings, e s Fremont St., n of Dauphin St., and 3 three-st'y brick buildings, n s Dolphin St., e of Fremont St.

Boston.

BUILDING PERMITS. — *Brick.* — *St. Botolph St., Nos.* 113 *and* 115, dwell., 26′ x 42′; owner, Joseph Feldman; builder, O. W. Patrick.

Wood. — *Crawford St.*, near Elm Hill Ave., dwell., 28′ x 34′; owners and builders, Wood & Weatherbee, Storage, 90′ x 150′; owner, Hoosac Tunnel Dock Elevator Co.; builder, H. W. Ball.

Summer St., storage, 50′ x 120′; owner, Maverick Wharf Co.; builder, A. J. M. McLaren.

Lee St., near Hayes St., stable, 20′ x 22′; owner, Michael Shanahan.

Batchelder St., cor. Albion St., carriage-house, 20′ x 30′; owner, E. L. Haiser; builder, G. Penney.

Jackson St., near Dorchester Ave., stable and storage, 30′ x 30′; owner, James Young; builder, D. A. Medbury.

Mechanics St., s w, dwell. and carriage-house, 18′ x 22′; owner, Joseph Gahne; builder, Jesse Jones.

Chestnut St., No. 6, dwell. and carriage-house, 18′ x 22′; owner and builder, same as last.

Dorchester Ave., No. 455, stable, 44′ x 100′; owner and builder, L. E. H. Jones.

Milton St., opposite Arnandine St., dwell., 23′ x 32′; owner and builder, F. E. Kennedy.

Dorchester Ave., opposite Bay St., dwell. and store, 22′ 6′ x 32″; owner, T. H. Le Masney; builder, John Bass.

West Seventh St., No. 54, dwell., 23′ x 36′; owner and builder, Patrick White.

C St., near West Seventh St., dwell., 19′ x 34′; owner and builder, Edward Devin.

Walnut St., near Ericsson St., dwell., 20′ x 28′; owner, Henry D. Buor; builder, H. P. Oakman.

Brooklyn.

BUILDING PERMITS. — *Metropolitan Ave., No.* 78, s s, near Olive St., three-st'y (brick-filled) tenement, tin roof; cost, $4,500; owner, Patrick McGuire, 349 Manjer St.; architect, E. F. Gaylor; builder, John Rueger.

Pacific St., n s, about 150′ w Nostrand Ave., 2 three-st'y front and four-st'y rear brown-stone dwells., tile and tin roofs; owner, Wm. Evens, Jr., and Chas. S. Whitney, 1218 Pacific St.; architects, Geo. P. Chappell & Co.; builders, James Ashfield & Son and Morris & Selover.

Lorimer St., s e cor. Frost St., 3 three-st'y frame (brick-filled) stores and tenements, tin roofs; cost, each, $4,000; owner, Elizabeth Coleman, Pierrepont House, Brooklyn; architect, E. F. Gaylor; builder, John Fallon.

Sumpter St., n s, 186′ w Rockaway Ave., 3 two-st'y frame (brick-filled) tenements, tin roofs; cost, $5,100; owner, Chas. H. Dyett, 1[illegible]1 East Fifty-seventh St., New York; builder, C. Monds.

Greenpoint Ave., s s, 100′ w Manhattan Ave., 5 two-st'y frame offices, gravel roofs; cost, each, $2,000; owner, Clark D. Rhinehardt, cor. Meserole and Newel Sts.; architect, Fr. Weber; builder, not selected.

West St., s e cor. India St., four-st'y frame tenement, gravel roof; cost, $10,000; owner, Mary E. B. Murray, 207 Washington Park; architect, Fr. Weber; mason, Martin Vogel.

Putnam Ave., n s, 40′ w Throop Ave., 2 three-st'y brown-stone dwells., tin roofs; cost, each, $9,000; owner, John F. Saddington, 462 Willoughby Ave.; architect, F. D. Vrooman.

Seventh Ave., e s, 21′ n Carroll St., 2 three-st'y brown-stone dwells., tin roofs; cost, about $7,000 each; owner and builder, Mr. Wooley, on premises; architect, Robert Dixon.

Putnam Ave., n s, 80′ w Throop Ave., 3 two-st'y brown-stone dwells., tin roofs, wooden cornices; cost, each, $7,000; owner, John F. Saddington, 462 Willoughby Ave.; architect, F. D. Vrooman.

Jefferson St., s s, 250′ w Throop Ave., 5 three-st'y brown-stone dwells., tin roofs; cost, each, $6,000; owners, etc., Phillips & Weild, 543 Greene Ave.

Heyward St., n s, 100′ w Broadway, two-st'y brick stable, tar and gravel roof; cost, $4,900; owner, Henry Newman; architect, Ernest Dennis; builder, John Auer.

Vanderbilt Ave., e s, 114′ s Fulton St., four-st'y brick flat, felt and gravel roof; cost, $14,000; owner and builder, Joseph I. Kirby, 73 Gates Ave.; architect, Amzi Hill.

Lafayette Ave., s w cor. Sumner Ave., four-st'y brown-stone flat, tin roof, wooden cornice; cost, $12,000; owner and builder, P. Concannon, cor. Van Buren St. and Sumner Ave.; architect, I. D. Reynolds.

Lafayette Ave., s s, 25′ w Sumner Ave., 14 two-st'y and three-st'y rear brown-stone dwells., tin roofs; cost, each, $5,600; owner, architect and builder, same as last.

Park Pl., s s, 275′ e Rogers Ave., four-st'y pressed-brick store and tenement, tin roof; cost, $7,000; owner, Peter Murphy, Rochester and East New York Aves.; architect, Ernest Dennis; builder, Charles Harlow.

Plymouth St., s w cor. Main St., 3 five-st'y brick warehouses, gravel roofs; cost for all, $98,000; owner, The Nesmith Estate, 117 Remsen St.; architect and builder, Thomas Stone.

Bergen St., No. 290, 150′ w Third Ave., four-st'y brick tenement, gravel roof; cost, $6,000; owner and contractor, Thomas Stone, 471 State St.

Gates Ave., s s, 145′ w Marcy Ave., 4 four-st'y stores and flats, gravel roofs; cost, each, $10,000; owner and builder, W. H. Aldrich, 503 Gates Ave.; architect, Thos. S. Godwin.

Madison St., s s, 190′ e Reid Ave., two-st'y brick dwell., tin roof; cost, $3,600; owner, Conrad Selmell, 585 Lorimer St.; architect, M. D. Randall; builders, I. & J. Van Riper and Stephen & Randall.

Jefferson St., No. 128, s s, 280′ w Evergreen Ave., two-st'y frame (brick-filled) dwell., tin roof; cost, $3,500; owner and builder, Chas. Tresbmann, cor. Bushwick Ave. and Bremen St.; architect, Th. Engelhardt.

Newell St., e s, 225′ n Nassau Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner, Andrew Waldron, Newell St.; architect, Amzi Hill; builder, S. B. Waldron.

Harrison Ave., No. 116, w s, 45′ n Middleton St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,000; owner, Mrs. Barbara Frank, on premises; architect, Th. Engelhardt; builder, B. Frank.

North Eleventh St., n w cor. Second St., three-st'y brick factory and 3 one-st'y brick factories; cost, total, $10,000; owner and builder, Francis Storms, on premises; architect, E. F. Gaylor.

Freeman St., s s, 50′ w West St., dyewood factory, tin roof; cost, $15,000; owner, N. Y. Dyewood Extract and Chemical Co., 161 Front St., New York; architect, Joseph Ireland; builders, Berton & Nickel and Hamilton & Henry.

Herkimer St., n s, 297′ w Ralph Ave., three-st'y frame tenement, tin roof; cost, $3,950; owner, Louis Klane, Herkimer St.; architect, Jacob Hertlin; builders, Christian Baur and Jacob Hertlin.

Fulton St., s s, 99′ w Grand Ave., three-st'y stone, brick and terra-cotta theatre, etc., tin roof, brick and stone cornice; cost, $35,000; owner, James M. White, 233 Park Pl.; architect, M. J. Morrill; builders, T. B. Rutan and J. T. Stafford.

ALTERATIONS. — *North Eleventh St.*, s s, 188′ 7″ w Third St., six-st'y brick extension, gravel roof; cost, $12,000; owners, Poulson & Elger, North Eleventh St.; architect, F. A. Winslow; builders, W. & T. Lamb, Jr., and B. Gallagher.

Fulton St., Nos. 335 *and* 337, through to Washington St., add one-st'y, also four-st'y brick extension, also new store front; cost, $7,000; owner, Edwin A. Goater, 287 Fulton St.; architect, M. J. Morrell; builders, P. J. Carlin and Morris & Selover.

Bedford Ave., s w cor. Lexington Ave., add three-st'y stores and flats, tin roofs, cost, $18,000; owner, J. H. Ireland, Quincy St., near Bedford Ave.; architect, I. D. Reynolds; builders, C. King and M. C. Rush.

Chicago.

BUILDING PERMITS. — J. Poske, two-st'y dwell., 263 Webster Ave.; cost, $3,000.

N. W. Lodge, I. O. O. F., three-st'y store and hall, 428 West Chicago Ave.; cost, $11,000.

H. G. Hutchinson, 5 two-st'y flats, 79-85 Avon Pl.; cost, $10,000; architects, Wilson & Moody; builders, G. Lehman & Co.

H. V. Bemis, six-st'y hotel, 187 and 188 Michigan Ave.; cost, $22,000; architect, H. V. Bemis; builder, A. Elmer.

J. Buckley, three-st'y store and flats, 895 West Madison St.; cost, $6,000; architects, Wilson & Moody; builders, G. Lehman & Co.

H. E. Rassing, three-st'y flats, 214 Huron St.; cost, $7,000; architect, L. J. Halberg; builder, R. Knight.

Mrs. N. Clark, two-st'y dwell., 880 Washington St.; cost, $5,000; architect, G. A. C. Smith; builder, W. R. Clark.

Sigmond & Co., stable, 192 Chicago Ave.; cost, $4,000; architect, H. Kley.

F. Thulmann, three-st'y store and dwell., 96 Clybourn Ave.; cost, $6,000; architect, Blumenthal.

A. Ganska, two-st'y store and dwell., 880 Twenty-first St.; cost, $4,000; architect, A. Bessler.

Geo. Kronberger, three-st'y flats, 247 Bissell St.; cost, $10,000; architect, T. Karls; builder, P. Young.

M. A. Seymour, three-st'y dwell., 397 Ontario St.; cost, $12,000; architects, Burling & Whitehouse.

R. C. Rounsvelt, 2 two-st'y flats, 292 and 294 Webster Ave.; cost, $8,000.

R. C. Rounsvelt, two-st'y dwell., 296 Webster Ave.; cost, $4,000.

C. M. Youngstrom, two-st'y dwell., 56 Locust St.; cost, $4,000.

H. H. Nathan, three-st'y store and dwell., 1565 Milwaukee Ave.; cost, $7,000; architect, H. Meissner.

C. T. Nash, three-st'y dwell., 329 Ashland Ave.; cost, $6,000; architect, F. B. Townsend.

St. Joseph's Home, four-st'y addition, 407 and 409 South May St.; cost, $10,000; architect, J. Dillenburg.

B. Quirk, 3 two-st'y dwells., 644–654 and 660 Carroll Ave.; cost, $6,000.

C. P. McKay, 2 two-st'y dwells., 287 and 289 Hermitage Ave.; cost, $8,000.

New York.

RIDING-SCHOOL.—For the gentlemen's riding-school, on Fifty eighth St., between Fifth and Madison Aves., an extension, 50′ x 200′, extending through to Fifty-ninth St., is to be built from plans of Mr. B. L. Gilbert.

STEAM-STATION. — The New York Steam Co. propose to build a steam-station on lots on One Hundred and Fifteenth and One Hundred and Sixteenth Sts. and East River, to cost $500,000.

STORES. — At No. 40 Canal St. a five-st'y brick store and dwell., 21′ x 40′, is to be built for Mr. Chas. Klingenstein, at a cost of $10,000, from plans of Mr. E. W. Granert.

For Messrs. Donaldson Bros., a five-st'y brick and stone store, about 50′ x 125′, is to be built on the n s of Park St., 116′ 6″ e of Pearl St., to cost $35,000, from plans of Mr. R. H. Robertson.

On Bloomfield and Little Twelfth Sts., between Tenth and Thirteenth Aves., a two-st'y brick and

iron store, to cost $65,000, is to be built for Messrs. John Glass & Son, from plans of Mr. G. A. Schellenger.

Messrs. Bondy, Lederer & Co. will have built a six-st'y tobacco warehouse, 48' x 110', to be built on the n e cor. of First Ave. and Sixty-ninth St., from plans of Messrs. A. B. Ogden & Son.

The Marvin Safe Co. propose to build a factory on South Fifth Ave. and Thompson St., between Prince and Houston Sts.

Building Permits. — *Chrystie St., Nos.* 173 *and* 175, one-st'y brick boiler-house, tin roof; cost, $3,000; owner, Harry Miner, on premises; architect, Henry J. Dudley.

Harrison St., No. 8, five-st'y brick warehouse, tin roof; cost, $13,000; owner, Wm. F. Nesbet, Yonkers, N. Y.; architect, Thomas R. Jackson; builder, Hugh Getty.

Harrison St., No. 12, five-st'y brick warehouse, tin roof; cost, $12,000; owner, W. H. B. Totten, 315 West Seventy-third St.; architect, Thomas R. Jackson; builder, Hugh Getty.

Jacob St., No. 14, six-st'y brick and iron front printing-house, plastic slate roof; cost, $35,000; owner, Mary B. Harmon, 68 East Thirty-fourth St.; architect, Alfred H. Thorp; builders, Jas. Hamel & Son and J. B. & J. M. Cornell.

Washington St., No. 109, six-st'y brick tenement and store, tin roof; cost, $13,500; owner, L. O'Connor, 111 Washington St.; architect, John P. Leo; builders, Walter Somers and P. J. Connor.

Ninth St., s s, 76' w Second Ave., four-st'y brick tenement, tin roof; cost, $10,000; owner, John B. Hagenbueckle, on premises; architect, Julius Boekell.

Forsyth St., Nos. 7, 9 *and* 11, 3 five-st'y brick tenements, tin roofs; cost, each, $13,000; owner, Henry Horn, 479 Broadway; architect, Henry Dudley.

Pike St., No. 31, five-st'y brick tenement, tin roof; owner, F. C. Lawrence, 267 Fifth Ave.; architect, J. E. Terhune.

White St., No. 20, six-st'y brick (iron front) store and lofts, tin roofs; cost, $24,000; owner, Leon Mandel, 20 East Seventieth St.; architects, Cleverdon & Putzel; builder, not selected.

Canal St., No. 232, and *Walker St., No.* 118, eight-st'y brick store, tin roof; cost, $20,000; lessees, Oxley, Giddings & Enos, 224 and 230 Canal St.; architects, Wm. Field & Son.

Bristow St., s s, 105' w Jennings St., three-st'y frame dwell., slate and tin roof; cost, $3,500; owner, Jos. Richardson, Cypress Ave. and One Hundred and Thirty-fourth St.

One Hundred and Forty-ninth St., s s, 150' w Courtlandt Ave., three-st'y frame tenement, tin roof; cost, $4,600; owner, Stephen Long, 632 East One Hundred and Forty-ninth St.; architect, Wm. Kusche.

One Hundred and Sixtieth St., n s, 175' e Courtlandt Ave., three-st'y frame dwell, tin roof; cost, $5,500; owner, Anton Standinger, 607 East One Hundred and Sixtieth St.; architect, A. Arctander.

Alterations.—*Sixth Ave., Nos.* 165, 167 *and* 169, one-st'y brick extension, also internal alterations; cost, $6,500; lessee, A. C. Cammeyer, 151 East Twenty-first St.; architect, Chas. Rentz.

First Ave., No. 103, raise one-st'y and a one-st'y extension on front, also internal alterations; cost, $6,000; owner, Fred. W. Bayer, on premises; architect, J. Boekell.

Jane St., No. 128, raise building two and a half stories and internal alterations; cost, $12,000; owner, John D. Hass, 242 East Broadway; architect, A. H. Blankenstein.

Broadway, n e cor. Bond St., new passenger-elevator, light court and internal alterations; cost, $7,000; owner, Adele L. S. Stevens, by U. S. Trust Co., attorney; architects, Alfred Zucker & Co.; builders, P. Tostevin's Sons.

Broadway, No. 372, part of the rear wall rebuilt, put in elevator; cost, $5,000; owners, heirs of Samuel Wyman, 32 Warren St.; architect, Samuel A. Warner; builders, Masterson & Harrison.

Madison Ave., No. 250, raise two stories and internal alterations; also a six-st'y extension; cost, $70,000; owner, M. N. Forney, 431 Fifth Ave.; architects, J. C. Cady & Co.; builder, not selected.

West Twenty-third St., No. 56, alter building for business purposes; cost, $10,000; owner, Wm. H. Jackson, on premises; architect, John Sexton.

South St., No. 90, rebuild front wall, iron girder over first story, and internal alterations; cost, $3,000; agent for owner, Edward A. Cruikshank, Brooklyn; builders, Peter Doyle and Daniel McEnenry.

Fifth Ave., No. 299, two-st'y brick extension, first-st'y floor, take out front and part of side wall in first-st'y, and put in iron girder, new store front, etc.; lessee, Henri O. Watson, 241 Fifth Ave.; architect, Geo. A. Freeman, Jr.

Philadelphia.

School-House. — The Committee on Property of the Board of Education have bids for the erection of a new school-house in the Thirty-first Section, to be located at Sargeant and Emerald Sts. The contract was awarded to Thomas Cassidy, whose bid of $38,000 was the lowest. The other bidders were: Thos. Campbell, $43,390; William Thompson & Bro., $48,775; John O'Donnell, $44,975; Chas. O'Neill, $41,900; and Franklin, $43,073. Contracts were also awarded for repairs on a number of schools in the various sections.

Building Permits. —*Sansour St.*, w of Thirty-ninth St., two-st'y stable, 27' x 37'; Jno. C. Kelly, contractor.

Ringgold St., w s, below Poplar St., 20 two-st'y dwells., 16' x 40'; Jno. M. Sharp, owner.

Ringgold St., e s, below Poplar St., 13 two-st'y dwells., 15' x 40'; owner, same as last.

Poplar St., s s, e of Twenty-fifth St., 3 three-st'y dwells., 18' x 58'; owner, same as last.

Twenty-fourth St., w s, below Poplar St., 13 three-st'y dwells., 16' x 52'; owner, same as last.

Twenty-fifth St., w s, below Thompson St., 5 two-st'y dwells., 15' x 41'; J. C. Morison, owner.

East Norris St., No. 908, two-st'y dwell., 18' x 40'; C. G. Harris, contractor.

North Twenty-fourth St., No. 1715, two-st'y dwell., 18' x 38'; Jno. Cronin, contractor.

Tioga St., w of Eighteenth St., 8 three-st'y dwells., 18' x 56'; Chas. L. Loney, contractor.

Dryson St., between Oregon and Seneca Sts., 22 two-st'y dwells., 14' x 28'; J. D. Thornton, owner.

Market St., between Oregon and Seneca Sts., 11 st'y dwells., 14' x 28'; owner, same as last.

Bridge St., No. 261, three-st'y dwell., 18' x 54'; Jacob Wengellinger, contractor.

Warnock St., above Huntingdon St., 2 two-st'y dwells., 14' x 48'; C. E. Coulson, contractor.

Huntingdon St., e of Eleventh St., 4 three-st'y dwells., 16' x 56'; contractor, same as last.

Germantown Road, above Huntingdon St., 4 three-st'y stores, 17' x 50'; contractor, same as last.

Germantown Road, above Huntingdon St., 6 two-st'y dwells., 15' x 50'; contractor, same as last.

American St., n w cor. Dauphin St., three-st'y factory, 67' x 114' 8"; Jas. McCartney, contractor.

Broad St., e s, above Catharine St., convent-building, 36' x 52'; Dubois & Welsh, contractors.

Thirty-fifth St., above Race St., three-st'y dwell., 17' 6" x 40'; Jno. Doyle, contractor.

Ninth St., below Arch St., four-st'y store, 19' x 73'; Robert F. Strode, contractor.

Style St., No. 48, three-st'y dwell., 16' 8" x 41'; Thos. Waters, contractor.

Indiana Ave., s e cor. Boudinout St., 7 two-st'y dwells., 14' x 28'; Jacob Peters, contractor.

Chestnut St., Nos. 117 *and* 119, 2 stores, 20' x 82'; Chas. P. Westerhood, contractor.

Sixty-fourth St. and Paschall Ave., 2 two-st'y dwells., 18' x 42'; R. H. Parker, contractor.

Shawmont Ave., e of Ridge Ave., two-st'y dwell., 18' x 44'; Wilson Rex, contractor.

Poplar St., w of Fortieth St., 2 two-st'y dwells., 16' x 48'; Steinmetz & Thompson, contractors.

Fifth St., above Columbia Ave., three-st'y factory, 54' x 56'; Geo. Kessler, contractor.

Ringgold St., below Berks St., 13 two-st'y dwells., 16' x 40'; H. R. Schoch, owner.

Taylor St., below Berks St., 57 two-st'y dwells., 16' x 40'; owner, same as last.

St. Paul, Minn.

Building Permits. — Two-st'y frame dwell., cor. of Exchange and Walnut St.; cost, $23,000; owner, Horace B. Bigelow.

Two-st'y dwell., s s Lincoln Ave., bet. Oakland and Dale Sts.; owner, Julia N. Goforth; cost, $5,400.

Two-st'y frame double dwell., s s of Iglehart, bet. Rice and Josette Sts.; cost, $5,000; owner, Patrick E. Murphy.

Two-st'y frame dwell., n s of College Ave., bet. Rice and Third Sts.; cost, $8,500; owner, P. S. Harvis.

Two-st'y frame dwell., e s of Bradley St., between Clark and Whitall; cost, $2,490; owner, J. B. Pugsley.

Three-st'y brick store and dwell., w s of Dakota Ave., bet. Fairfield and Indiana Sts.; cost, $7,000; owner, James Jordan.

Two-st'y frame dwell., s s of Isabel St., bet. Boswell and Winslow; cost, $2,000; owner, H. L. Tilleman.

Three-st'y frame addition to Manufactory n s of Fourth St., between Locust and John Sts.; cost, $2,200; owners, Blodgett & Osgood.

Two-st'y frame double dwell., s s of Lincoln Ave., between Oakland and Dale Sts.; cost, $3,000; owner, F. F. McIver.

Two-st'y frame double store and dwell., e s of Park Ave., bet. Manitoba and Winnepeg Sts.; cost, $1,800; owner, L. A. Strom.

Two-st'y frame double dwell., s s of Grove St., bet. DeBow and Mississippi; cost, $6,000; owner, Catherine A. Finehout; cor. Grove and Cooper St.

Two-st'y frame dwell., n s of Edmund St., bet. Rice and Marion; cost, $1,730; owner, John Kraug.

Two-story frame dwell., s s of Forest St., bet. Dawson and Margaret; cost, $1,300; owner, W. F. Thompson; store n s of e Seventh St., bet. Waukesha and Cedar Sts.: cost, $2,000; owner, John Kline.

Two-st'y frame double dwell., w s of Maria St., bet. Fifth and Sixth St.; Cost, $4,500; owner, H. Damkroger.

Three-st'y brick Veneer double store and dwell., n s of Rice St., bet. Iglehart and Summit; cost, $9,000; owner, T. F. McCormick.

Two-st'y frame dwell., n s of Iglehart, bet. Kent and Dale; cost, $2,000; owner, M. D. Miller.

Two-st'y brick store and dwell., n s of e Seventh St., bet. Bradley and Burr; Cost, $5,000; owner M. Mullane.

Two-st'y frame dwell., e s of Douglass, bet. Smith and Ramsey Sts., $2,490; owner, James Cady.

Two-st'y frame dwell., s e side of College Ave., bet. Peter and Rice Sts.; cost, $2,780; owner, Peter Bender.

Two-st'y frame dwell., Evergreen Ave.; cost, $2,000; owner, J. H. Bryant.

Four-st'y brick block store and dwell., n s of e Fifth St., bet. Robert and Minnesota Sts.; cost, $25,000; owners, H. A. Town and C. G. Higbee.

St. Louis.

A. Alt, two-st'y brick dwell.; cost, $8,000; Kirchner, architect, Mulcahey & Milburn, contractors.

W. & S. Padberg, two-st'y double brick dwell.; cost, $5,000; Paulus & Weidemüller, contractors.

J. Burdeau, two-st'y brick dwell.; cost, $4,000; John H. Dunlap, contractor.

J. M. Carpenter, two-st'y brick store and dwell.; cost, $6,000; A. Beinke & Co., architect,

M. Lane, two-st'y brick dwell.; cost, $4,000; M. Lane, contractor.

G. B. Morgan, three-st'y brick dwell.; cost, $6,000.

C. C. Murphy, two-st'y brick dwell.; cost, $5,000; J. Johnston, architect.

O. C. Murphy, two-st'y brick dwell.; cost, $5,000; J. Johnston, architect.

T. L. Waldecker, 2 adjacent two-st'y brick dwells.; cost, $1,200; H. R. Becker, contractor.

A. Brothers, two-st'y brick addition to dwell.; cost, $5,000; A. Druiding, architect; J. H. Frye, contractor.

P. J. Pauly, two-st'y brick dwell.; cost, $15,000; F. Mayer, architect, N. Risse, contractor.

Schaeffer Bros. & Powell, two-st'y brick warehouse; cost, $2,500; N. Risse, contractor.

N. Risse, two-st'y brick dwell.; cost, $4,000; N. Risse, contractor.

COMPETITION.

State-House. [At Denver, Col.]

State of Colorado,
Office of the Board of Capitol Managers,
Denver, April 16, 1885.

In pursuance of an Act of the Fifth General Assembly of the State of Colorado, entitled "An Act to provide for the erection of a State Capitol Building at the City of Denver, and creating a Board of Management and Supervision, and appropriating funds therefor," plans and specifications for a Capitol building which, when erected, shall not cost to exceed one million of dollars, will be received by the Board of Managers **until 12 o'clock meridian, on the tenth day of July, 1885.**

The said Capitol building will be erected upon the summit of a plat of ground in the city of Denver, State of Colorado, known as Capitol Hill, with its principal façade to the west. The length of said building to be about 300', and no plans will be considered for a building that are over 310' in length. The breadth, height and general form must be in such proportion to its length as to constitute a symmetrical building, and must be constructed with special regard to strength and durability. The facing and ornamentation of the superstructure, including cornices, pediments and balustrades, will be of stone.

Drawings must consist of foundation, sub-basement, basement, or first, second or third story plans, roof plans, and section of same, longitudinal section, transverse section, front, rear and end elevations, dome plan, giving section of same and material used, and method of construction from base to summit. Also giving diameter or area of base, style of architecture and extreme elevation.

The said Capitol building shall be built of stone, brick and iron, as far as practicable, and of material found in the State of Colorado, provided the same can be found in said State as cheaply as other materials of like quality in other localities. The entire building must be made as nearly as possible fireproof. The laws of acoustics must be carefully observed. The materials used in said building must be of the best quality. Provision must be made for steam-heating apparatus, and for the drainage, lighting and ventilation of said building in the most approved manner; and such a number of fireproof vaults as may be necessary for the preservation of the books and papers of the various departments of the State Government; also for elevators, water closets, etc.

All plans and scale drawings must be put on wooden frames or stretchers in order that they may be convenient for examination, and on a scale of one-eighth of an inch to one foot.

Compensation for plans and specifications will be as follows: For the best set of plans and specifications the sum of $1,500; for the second, $1,000; for the third, the sum of $800. All plans and specifications for which money is paid shall become the property of the State. The architect whose plans are adopted will be required to furnish the same in duplicate. For the detailed working plans and supervision, the amount shall not exceed two and one-half per cent of the cost of said building. No plan will be adopted until it shall be definitely ascertained that the entire cost of said Capitol building shall not exceed the sum of $1,000,000.

Said building must contain the following rooms, and such other rooms as convenience and symmetry require:

The sub-basement shall be eight feet between joists, and adapted to the use of the machinery, etc., of the building.

The basement story to be not less than fourteen feet between joists, and extend twelve feet above the surface of the surrounding ground. Said basement story to be divided into rooms to be used for the Adjutant-General's quarters, Historical Society, Horticultural Society, State Geologist and Mineral Cabinet, Commissioner and Inspector of Mines, and Storage Rooms.

First, or principal office story, to be not less than twenty feet between joists, and to contain, as near as practicable, the following rooms, to wit:

Three rooms for the Governor.
Same for Secretary of State.
Three rooms for Auditor of State.
Same for State Treasurer.

Two rooms for Insurance Department, two rooms for Attorney-General, three rooms for State Engineer, three rooms for Railroad Commissioner.

Four rooms for State Board of Land Commissioners, three rooms for Superintendent of Public Instruction.

Second, or double story, to be not less than forty-two feet between joists. The Senate Chamber, Hall of House of Representatives, Supreme Court Room and State Library to be of full height, other rooms to be approximately half of said height.

One Senate Chamber, with lobbies and galleries of appropriate dimensions, to accomodate fifty Senators; one room for Lieutenant-Governor and President, one room for Secretary of Senate, one Post-office, one Stationery and Bill room, one Sergeant-at-Arms room, cloak room, lavatory and closets; two rooms for Engrossing Committee, two rooms for Enrolling Committee, and not less than ten other appropriate committee rooms for use of Senate.

One hall for House of Representatives, with lobbies and galleries of appropriate dimensions, to accomodate one hundred members; one room for Speaker of the House, one room for Chief Clerk of House, one Post-office, one Stationery and Bill room, one Sergeant-at-Arms room, cloak room, lavatory and closets, two rooms for Engrossing Committee, two rooms for Enrolling Committee, and not less than ten other appropriate committee rooms for the use of House of Representatives.

One State library room, one Librarian's room, and ten committee rooms.

One Supreme Court room, one law library room, one Clerk of Court room, one Marshal of Court room, one consultation room, six judges' private rooms, with fireproof vaults, lavatory and closets attached.

Public lavatory and closets on each floor of said building.

The drawings must be sent to the "Board of Capitol Managers," Denver, Colorado, and be endorsed "Plans for State Capitol Building," and must come under a *nom de plume*, the real name and address to be sent to

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS.

IN view of the embarrassment in which the founders and late publishers of this journal find themselves temporarily involved, it may be well to forestall even the slightest agitation on the part of our subscribers or advertisers by saying plainly that the misfortune alluded to affects this journal only through the sympathies of its editors. So far as business relations go the journal, under the same editorial management as always, will continue to fulfil all its obligations to subscriber and advertiser.

THE Pullman experiment continues to excite great interest among those who desire the amelioration of the condition of working people, as well as among sanitarians, and an appendix, containing a description of the town and its industries, is said by the New York *Evening Post* to have been added to the reports of two State Bureaus of Labor Statistics. The writers of these reports naturally regard rather the effect of the Pullman system on the men employed there than more material considerations, but they agree that the Pullman Company, by its thoughtful common-sense, has done about as much to inspire a similar quality in those whom it employs as its enlightened sanitary provisions have to instil habits of cleanliness in those who live in the houses belonging to it. The past year has not been a prosperous one with the car-manufacturing company, and wages have been reduced, but the managers of the company were courteous and sensible enough to present to their workmen a clear statement of the items of expense in manufacturing their cars, and the cost of raw materials, together with the state of the market, the prices obtainable for the finished cars, and the prospects of competition; and the men, understanding by this that diminished cost of production was essential to retaining a market for the cars, acquiesced without difficulty in the reduction of salary proposed to them.

WE shall be excused, we hope, for saying that this seems to us an occurrence of great importance for this country. On the other side of the ocean the practice of treating the workmen in manufactories as something different from portions of the machinery is becoming quite common; but in this country the idea of the dependence of labor and invested property upon each other is almost new, and it is fortunate that the managers of the Pullman Company should have been among its first expounders. Thanks to their wisdom, the rational view of the matter seems to have been immediately adopted by their men, who now, as we are told, hold to the theory that Mr. Pullman is "merely the agent employed by themselves to secure steady work for them at such wages as the car-building trade will afford." Practically, this is exactly the truth, and the fact that Mr. Pullman, in doing so, secures for himself a moderate interest on the money which he and his stock-holders have invested in the business, does not alter the character of the relation between him and his men. The latter would be the last to wish to see him working for them for nothing, or to deprive the people who have put their savings into the company of their legitimate return, and neither they, nor the millions of working men like them would, we venture to say, ever dream of refusing to make reasonable sacrifices when called upon with the frankness and courtesy which the Pullman Company seems to have shown. One of the reports hints that at some future date a plan may be devised for admitting the workmen employed by the car company to a share in the business, but regards this as a matter of secondary importance, on account of the happy state of affairs under the present system. It should be remembered, however, that men are not, and should not be, content with an unvarying condition, even though a happy one; and a prospect of future improvement in the relations between them and their employers will be for most a valuable stimulus to good conduct. It would not be really necessary to make any change in the constitution of the company to enable the workmen to share in its business, since any one can buy the stock in open market; but something might easily be done to encourage such an investment of their savings by subdivision of shares, or by the issue of interest-bearing receipts for instalments paid on stock to be held by the company until fully paid for, or by the formation of small syndicates to hold shares and divide the income from them. This would be for the interest of the company as well as of the men, for the holder of a half or quarter share would be quite as zealous to increase the size of his dividends upon it as the owner of a thousand shares, and would, as a workman employed by the company, be in a much better position to promote the fulfilment of his wishes; so that, small as might be the interest of individual workmen, the aggregate of their holdings, and of their efforts to increase their value, would be anything but insignificant, and the examples of the Godin establishment at Guise, and of the paper manufactory of Laroche-Joubert at Angoulême, show that the workmen are likely to hold before long a very large portion of the capital employed in the business.

THE Rotch Travelling Scholarship has been awarded this year to Mr. S. W. Meade of Boston, in accordance with the result of examinations differing from those of last year mainly in the reduction of the time necessary for complying with their requirements. This was thought to be desirable, in view of the fact that the candidates are generally employed as draughtsmen in offices, and cannot well afford to lose their salary for the four or five weeks which it was last year necessary to devote wholly to the examination work; and the thoroughness of the test does not seem to have been affected by lessening the time allotted to it. Mr. Meade will sail very soon for Europe, to begin his two years of travel and study under the most favorable auspices. It is gratifying to know that the winner of the prize last year, Mr. C. H. Blackall, has been received with the utmost kindness by foreign architects, to whom he carried a general letter of introduction as the holder of the scholarship, and has gained credit for the profession in the United States, as well as for the foundation which sent him abroad, by his industry and attainments; and we hope that his successors will long continue to deserve and increase the good opinion of young American architects which he has done so much to secure. In view of the interest which this annual contest excites in architects' offices throughout the State, we have heard it suggested that the examination questions should be published, in order that intending competitors may be enabled to judge whether their professional knowledge is likely to be sufficient to secure for them a favorable position in the race. If those among our Massachusetts readers who would like to have this done will send us word, we will see what the Trustees of the Scholarship fund say about it.

TAKING all the circumstances into consideration, it is probable that epidemics, in modern times, save more lives than they destroy, by the unusual cleanliness and care to which people are driven by the alarm which they create; and if the

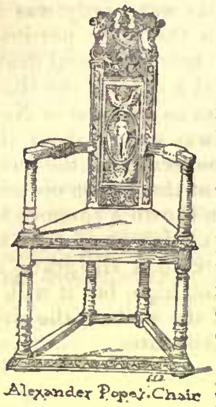
cholera, which is expected to arrive here from France this summer, should treat us as gently as it did the French last year, the net saving of disease and death for the season seems likely to be very considerable. The first appearance of a "cholera scare" this year seems to have been in New York, where it was suspected of having been concocted in the interest of speculators; but the feeling that it is time to make ready against the coming of the disease has now spread to places where a pretence of public spirit is not so often used as a cloak for schemes of private plunder, and we are likely to see some very efficient sanitary work done within a few months. The city which seems to need most urgently a thorough sanitary reform is St. Louis, where a Citizens' Sanitary Aid Association is already hard at work. A document has just been issued by this association, addressed to the owners and users of well-water in the city, pointing out forcibly the danger to which the drinking of such water exposes them at a time when intestinal diseases are prevalent. At present, although there is a good city water supply, there are in St. Louis between six thousand and eight thousand wells, the water of which is used, not only by private families, but by the public, street-corner wells in some places doing the duty which hydrant pumps do in other towns. The walls are sunk through gravel to a stratum of seamed and disintegrated limestone, through which water percolates very freely, and, as analysis conclusively shows, the washings of street gutters and privy vaults, with the leakage from the sewers, runs, almost without hindrance, into them. As every one knows, the ordinary test for pollution of well-water is made by ascertaining the proportion of chlorine present in the water. The chlorine itself is harmless, but its presence, except in a small proportion, shows that salt has somehow found its way into the water. Salt is never found naturally in the soil, except on the seashore or in the vicinity of salt mines, and as its principal use is in the food of human beings, its accidental presence in the ground is almost invariably due to the deposition there of human excretions, which contain, dissolved, nearly all the salt of the digested food; and the appearance of an abnormal amount of salt in water taken from the subsoil of towns thus indicates with certainty that salt from human excreta has washed into it, and with the salt such other soluble or suspended matters as the excreta in question may have been in condition to furnish.

TO test the probable pollution of the well-water, the association had a number of samples analyzed, and found them to contain from fifteen to thirty-six grains of chlorine to the gallon. In the case of the better of these two samples, which was taken from a public pump, sunk in the sidewalk of a street through which a brick sewer ran, the well-water contained practically the same proportion of chlorine as the liquid in the sewer, showing that the sewer furnished water to the well, strained of its more obvious turbidity by soaking through the ground. In the worst case, the well examined was about thirty feet deep, and was situated midway between two rows of privies, fifteen feet distant from each row. As a moment's thought will show, a line drawn from the nearest vault on each side to the bottom of the well would have an angle of about sixty degrees with the horizon, and down this steep hill the liquids from the vaults evidently flowed so rapidly as to reach the well almost undiluted. As the circular of the association judiciously points out, even such well-water as this probably does no great harm, except where typhoid poison finds its way into it, but the importation of a case of cholera into the neighborhood of one of the wells, or into a house communicating with one of the sewers which feeds wells on its course, would immediately set in motion towards such wells a stream of excremental liquid, turbid with thousands of millions of the specific germs of the disease, any one of which, if taken into the system, would be sufficient to set up the most virulent case of cholera, multiplying itself almost to infinity, and setting a fresh stream of poison on its way to infect the neighborhood. This is the well-known mode in which cholera is spread, and the exceptionally dangerous character of the conditions which prevail in St. Louis may be inferred from the history of the cholera epidemic of 1849, when, although the population was very much smaller, the number of deaths from this disease alone was sixty-eight in a thousand, or more than six times as many as in New York, and more than twice as many as in New Orleans, a city which is notorious for possessing all advantages except that of healthfulness. In 1866, after a public water-supply had been introduced, cholera again visited the country, and although in the new portions of St. Louis, where the city water only was in use, there were no cases, the mortality in the older portions, which used the wells, was so great as to bring the total death rate from cholera alone to seventeen and a quarter per thousand of population, or nearly thirteen times as many as in New York. At this time, although much less was known about the dissemination of cholera than now, the connection of the wells with the disease was so evident that many of them were ordered to be closed, and the city authorities have shown a commendable prudence this year in directing the closing at once of all wells which furnish water containing more than six grains of chlorine to the gallon. This limit is far too high, but it will, it is said, serve to abolish a great majority of the wells in the city, and more stringent precautions may be taken later.

THE *Sanitary World* offers a warning to persons who are in the habit of advancing money on mortgage to builders without examining the structures intended to secure the loan, which derives additional emphasis from the recent fall of one Buddensiek block in New York, and the enforced rebuilding of others which is now going on by direction of the Building Bureau. In the English case to which the *Sanitary World* refers, a builder of the Buddensiek sort had erected in London two houses, the workmanship of which was far from satisfactory to the district surveyor, who complained against him for using bad mortar, and had him fined for the offence, and ordered to change his method of building forthwith. The builder took no notice of the order, but completed the houses ready for occupancy, and then managed to obtain, as builders know how to do, a large loan upon them, giving a mortgage in return. The Metropolitan Board of Works, whose mandate he had disobeyed, had in the meanwhile, however, instituted legal proceedings against him, and obtaining a verdict, with the necessary authority from the Court, it proceeded, after ordering out the occupants, to demolish both the houses, and with them the security of the unfortunate lender, who had really bought the houses at a high price from the builder, without troubling himself to inquire about defects which, as it proved, made them worse than worthless. The *Sanitary World*, while deploring the success of the trick by which the rascally builder shifted the consequences of his misdeeds upon the innocent mortgagee, points out that the latter, by taking the precaution to inquire of the district surveyor as to the character of the houses, might easily have ascertained that they were not only defective, but had been actually condemned, and ordered to be taken down, and would thus have been warned against throwing away his money in a loan upon them; and truly says, that notwithstanding the hardship to the mortgagee, his want of prudence should not be allowed to interfere with the public welfare, which unquestionably demanded the destruction of the buildings.

LE GENIE CIVIL gives a short account of the reunion of the employés of the great Chaix printing-house in Paris, one of the establishments which practices the sharing of the profits of its business with the operatives employed in it. About three hundred and fifty men and women were present at the meeting, and listened first to the report of the committee of consultation on the financial results of the past year. During the year, as appears from the report, about two thousand dollars had been deposited by the operatives in the Government savings bank, sixty-eight had taken or continued accident insurance policies, and other investments had been made by various operatives, amounting to about twenty-two hundred dollars. M. Chaix then announced that the percentage of profits assigned to the operatives amounted for the year to fifty-nine hundred dollars, which would be shared at the rate of three and six-tenths per cent on each person's salary for the year. Besides this, an extra dividend would be paid amounting to six per cent of the share of profits, which had accrued from the forfeitures of profits incurred by persons leaving the establishment. Although the profit to be divided does not seem very large, it must be remembered that business is as dull in Paris as here, and that the competition in the printing trade is very great, so that, while the Chaix operatives may not be getting rich very fast, they will enjoy their Easter dividend of twenty or thirty dollars apiece as much as they might a larger one in more prosperous times.

HOW TO DRAIN A HOUSE.[1]


Alexander Pope's Chair

THIS is the title of a little book by the most popular of all writers on sanitary matters, containing the latest observations and opinions of one who has the great merit in an adviser on technical subjects of frankly changing his opinions whenever his increasing experience shows him the propriety of doing so. To this merit Colonel Waring joins another, — that of a peculiarly clear and forcible method of expressing his ideas, and if experts find his double-leaded pages less compactly filled with suggestions of value to them than they would like, they must remember that the author does not write for engineers, but for the public, and that his lucid and leisurely explanations, aside from their charming literary style, are much better adapted to interest and instruct the average householder than the dry volumes in which the professional man delights.

For this reason the book offers very little to professional criticism. In other hands it might, with all its merits of style, have become only a means of misleading its readers, but Colonel Waring is far too skilful and experienced to make mistakes in an elementary treatise, and nearly all that he says will be practically approved by every sanitarian. The point on which the main difference of opinion would occur would probably be that of trap-ventilation, Colonel Waring in this book declaring plainly his belief that the back-ventilation now required by law in most large cities is so much worse than useless that if he were compelled to put in the back-vent pipes, as in his practice he often must be, he would be tempted, after their completion, to make them "inoperative by closing the main ventilation pipe at some point near its upper end."

We do not hesitate to say that this seems to us to be going altogether too far, in the present state of knowledge on the subject; and although we are quite willing to agree with those who sympathize with Colonel Waring's view that the present plumbing laws allow too little discretion in such matters to the designer of a plumbing system, we should be sorry to see liberty given to the readers of his book to stop up vent pipes according to their interpretation of his opinions.

It should be remembered that very few non-professional readers of works of this kind will stop to distinguish between definite rules and mere suggestions; and, besides the proposition to stop up vent pipes, there are one or two others of the latter, such as that relating to a revived "tip-up" basin arrangement, and another describing, with rather guarded approval, the ancient method of connecting bath and basin wastes with water-closet trap, which we think could hardly be followed out without disappointment, if not danger.

So much being reserved, the little volume may be commended without hesitation to the favor, not alone of the intelligent non-professional man, but, in another way, of engineers and architects, who although they probably know nearly all that is in it, with a great deal besides, are often called upon to recommend simple technical books to their clients, and will find this one of the best of the kind.

We present, with more than ordinary humility, our apologies to Signor Bonanno, who forwarded to us just at the busiest season of our year the advance specimen sheets of one of the, in many ways, most notable publications[2] relating to architecture that has ever been undertaken.

Signor G. Damiani Almeyda, architect, engineer, and Professor of Drawing in the Royal University of Palermo, having, in the course of his duties at the University, discovered that there was not in existence any comprehensive work embodying a progressive course of architectural drawing, has had the patience to prepare such a work on the most elaborate and expensive scale. More than this, finding that no publisher was willing to incur the cost of so expensive a work, he has had the audacity to turn publisher himself, and it is now being produced under his personal supervision. "This I have done," he says, "without measuring the cost, having only in view the usefulness of the undertaking."

With these sheets before us, we cannot doubt either of these assertions. Of the general scope and character of the work, Professor Almeyda says: —

"From the first lines of ornamental design to the highest architectural composition, I have strictly followed the purest styles of the best epochs of ancient art, taking for my prototype Nature, a source of infinite beauty, from which the greatest masters were and are able to produce their masterpieces.

"Avoiding that minuteness of execution which belongs more to the embroiderer than the artist, I have imitated in the models of antiquity their freedom and imposing firmness of execution, which, together with accurate manipulation, is only the fruit of long practice and observation.

"When possible, with the exigencies of space, I have copied the antique models on the same scale as the originals, so that the student might see how the ancients, according to the proportions of the treated subject, varied their manipulation.

"Some of the original drawings are in simple outline of pen or pencil; others, either in half or in full light and shade, but most are in water-colors, according to the requirements of a perfect representation of the subject. The former will be executed in lithography or engraving, and the others in chromo-lithography.

"The work is divided into three volumes in folio, 27 1-2" x 23 3-4", on specially prepared paper, and each volume will contain forty plates.

"The first two volumes consist of a complete course of ornamentation taken from the antique, and placed in comparison with Nature, and the orders of the antique and modern Greek and Roman architecture.

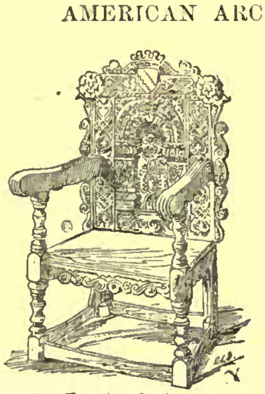
"The third volume is dedicated to architectural composition, with a study of the adjustment and superposition of orders, and high composition in a series of plans of secular edifices, chosen from the most difficult for composition and study. These are on a large scale, with all the details necessary in construction for the material execution of the work. This will be of great help to the student, in the difficulties he may encounter in practice. I may add that all the designs of this third volume have been selected from many that have gained the principal prizes in the various exhibitions of fine arts, these having been found the best in composition."

These statements are fully supported by the plates before us, which represent specimens of the illustrations of the several volumes and show satisfactorily the manner in which the generous programme is to be carried out, and nothing but praise can be accorded to their execution in the matter of delineation and, in only a slightly less degree, to their coloring, which is a little hard and unsympathetic as chromo-lithographs of architectural subjects are apt to be.

But in spite of the manifest excellences of the work, one cannot but question the wisdom of the undertaking looked at simply from the business point of view. It is the kind of enterprise which should be undertaken by a government through its recognized Academy of Fine Arts rather than by a private individual, as the burden of expense must be so heavy, even in a country like Sicily, where, as in Italy, we may suppose skilled artistic labor is relatively cheap, that it is not unlikely to be found that the private purse of the energetic Professor is not able to endure the draught upon it, and consequently either the entire abandonment of the publication or a very undesirable lowering of the standard of excellence adopted for the mechanical execution of the work may be brought about.

The appreciation of publications of this class is so different in this country and in Europe that it is difficult to gauge the commercial value of the undertaking, but our impression is that but few architects in America would think it prudent to spend one hundred and twenty dollars for Professor Almeyda's work, even if they are expected to pay for it in installments, spread over four years, of three dollars per part as published. But we should say that all public libraries, societies of fine arts, and clubs which maintain libraries and art collections ought to feel that this work will prove a desirable acquisition.

AMERICAN ARCHITECTURAL JOURNALS.


Old English Chair, formerly belonging to the Countess of Derwentwater

IT will be quite difficult for any one who has the fortune to see a copy of the most recent adventurer which joins the ever-increasing ranks of building journals in this country to forget the title which its projectors have selected for it. Seventeen times upon the first page its titular appellation confronts the reader with all the insistence that capitals are capable of exerting. The "long-felt need" is once more annihilated, but we notice that the sensitiveness of this need is of such a peculiarly pertinacious vitality that, though it is buried at least once a year, it comes to life again with equal regularity.

We say that the *National Builder* is the latest accession to the technical literature of the building art in this country, and yet we cannot feel sure that it is, as the class seems a peculiarly fecund one. It may be interesting to give the following list of the still surviving journals which in one way or another endeavor to educate the building classes: —

1868, *The Builder and Wood-worker* (formerly the *American Builder*). New York.
1876, *The American Architect and Building News.* Boston.[3]
1879, *Carpentry and Building.* New York.
1879, *The California Architect and Building News.* San Francisco, Cal.
1879, *Cincinnati Building Review.* Cincinnati.
1882, *Building.* New York.
1883, *The Builder.* Holyoke, Mass.
1883, *The Inland Architect and Builder.* Chicago.
1883, *The Northwestern Improvement Record.* St. Paul, Minn.
1883, *The Journal of Progress.* Philadelphia.
1883, *The Building Trade Journal.* St. Louis, Mo.
1884, *The Builder and Manufacturers' Journal.* Pittsburgh, Pa.

And these are not all, nor do they include any journals which do not make building the chief object of their care, though in most cases

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[1] "*How to Drain a House.*" Practical Information for Householders. By Geo. E. Waring, M. Inst. C. E. Consulting Engineer for Sanitary Drainage. New York: Henry Holt & Co. 1885. Price $1.25.

[2] "*Institutions of Architecture and Ornament,*" based on ancient Art and on Nature. By G. Damiani Almeyda, Architect, Engineer, and Professor of Drawing in the Royal University of Palermo. To be published by subscription in forty Parts. Price, $3.00 per part.

[3] Published weekly; all others mentioned are issued monthly.

it may be said of them that their cultivation of the field is somewhat scattered and general in its nature, few of them giving exclusive attention to any one portion of the many subdivisions of the art of building.

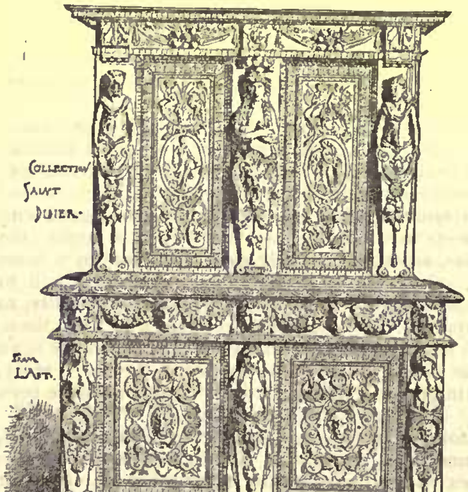
The *National Builder*, however, proposes to concentrate its attention upon the point "where the architectural journals leave off," and by so doing hopes to make the "*National Builder* the phenomenal journal of the building art." This hope is a laudable one to entertain in private, but it seems a little unwise to indulge in magniloquence so early in the struggle for survival, for the fitness which is the touchstone of journalistic existence, at least, is a thing to be accomplished by deeds rather than by assertions. Moreover, it tempts the critic to be a little captious, for he feels that the invitation to send his own journal in exchange for the *National Builder*, under the assurance that his "columns will be criticised and commented upon," will probably lead to the wearing of frequent sackcloth. The bombastic tone which appears in this first issue is, we think, more likely due to the publishers than to the editor.

The essential and distinguishing feature of the *National Builder* is a colored plate of fair execution, showing, in plan and elevation, a wooden dwelling-house of the most pronounced Western vernacular, and a sheet of details on manilla tissue paper, which are said to form a "complete set of architect's plans," a statement which any architect who sees them will probably feel is distinctly libellous.

Another feature is the "American glossary" of architectural terms, of which a page is given, which contains one hundred and twenty-seven words beginning with A, and of which forty-three only can by the widest construction be considered either ordinary terms or useful. The balance is made up of such words as "abamurus," "abeus," "acrolinthon," "ædisiola," "actiaior," "allerion," "anabathrum," "andronitis" and the like: words which we have no shame to confess we never saw before and never expect to see again, though we may perhaps hear them used by some carpenter who has laboriously mastered them and their definitions, and uses them in place of the ordinary English term or some vernacular periphrasis.

We speak above of the *Northwestern Improvement Record*, but we have just opened the last issue of that journal, and discover that its title has been changed to the *Northwestern Architect and Improvement Record*, but we see it speaks of itself editorially as *The Architect*, pure and simple. This we think is a mistake, for we presume that so excellent a journal is frequently represented in the daily papers by extracts, and if these are credited to "*The Architect*" only, it is likely to be obliged to share honors which should be its own alone with the London journal of the same name, or even with ours, which is often so styled by exchanges who overlook the patriotic prefix. Apart from this objection, the change of style is judicious, as its former title was not an index of its character, which was essentially that of an architectural journal, while the name might as appropriately relate to milling, which, rather than architecture, one is rather more likely to associate with the Northwest. Although one of the youngest of the journals of its class, it is by no means the least vigorous, and it comes uncommonly near being that *rara avis* of journalism, a monthly periodical which is not nearly a month behind the times. It really seems, looking at the matter longitudinally, as if the field of architectural journalism were now pretty fully occupied by representatives at Boston, New York, Cincinnati, Chicago, St. Paul and San Francisco, though Salt Lake City still offers an unseized opportunity. But in the matter of latitude there are still openings which we expect to see closed by other journals of the class, and we trust that in each case the new journal may become the centre of as healthy and vigorous an impulse as our distant neighbor at St. Paul.

BRONZE STATUES FOUND AT ROME.



THE discovery of an antique bronze statue such as that found on Sunday, February 8, or even the part of one, is an event of the greatest rarity. Since the commencement of the building operations for the conversion of mediæval Rome into a modern capital, and the new impetus simultaneously given to works of excavation for antiquarian purposes only, an incredible number of marble statues, busts, bas-reliefs, and other works of sculpture have been found. Scarcely a day passes without something of the kind being disinterred. It may be a mere fragment or, as has occurred more than once, half a dozen statues and busts lying together. These have been sufficient not only to fill but to crowd a new museum in the Capitol, without taking into account a series of great store-rooms piled up with mutilated statues awaiting restoration — heads, trunks, limbs, and fragments still unsorted, among which, as experience has taught, there are doubtless many pieces that will be found to fit each other, to the restoration of more or less complete works. But among this marble population, this mass of artistic treasure, accumulated in the course of fourteen years, the only bronzes discovered have been the feet, one arm, and some pieces of the drapery of a statue found on the line of the Tiber-embankment works, and supposed to be the remains of one of those erected to Domitian that had been thrown down and flung into the river, the head of a bronze statue of the Emperor Augustus, and some unimportant fragments.

We have a record dating from the middle of the sixth century that there were at that time no fewer than 4,000 bronze statues in Rome. Cassiodorus describes the number of statues that adorned the city as almost outnumbering the living population. Poggius, Pope Martin V's Secretary, about the middle of the fifteenth century, laments that of all this wealth of art nothing remained but one bronze horse (the equestrian statue of Marcus Aurelius) and five marble statues. Since then thousands of marble statues, busts, and bas-reliefs have been brought again to light. The Vatican Museum alone contains 2,000 of the grand total comprised in the Capitoline, Lateran, Ludovisi, Albani, Torlonia and other galleries in Rome, the Uffizi in Florence, the Louvre, the British Museum, and the contents of the Berlin and St. Petersburg galleries, to say nothing of the numbers of marble statues scattered through the private palaces of Rome and elsewhere, and the multitudinous results of the excavations here since 1871 I have already mentioned. But, alas! the bronze statues recovered can be counted on one's fingers and leave some to spare. The Vatican Museum can only boast of one, and the Capitoline of but three, exclusive of "the thunder-stricken nurse of Rome," and the mutilated remains of some others. A lapse of years occurred between the dates when they were discovered. There is no record as to when or where the youth extracting a thorn from his foot and the statue of another youth, a patrician assistant at the sacrifices, were found. At the end of the fifteenth century the gilt bronze Hercules of the Capitol was discovered near the Forum Boarium. In 1849 a bronze horse, much injured, one of the feet of its rider, and the posterior half of a bronze bull were dug up in the Vicolo delle Palme. In 1864 the colossal gilt bronze Hercules in the Vatican, now called the Hercules Mastia, was found beneath the Palazzo Righetti among the vestiges of Pompey's buildings on the Campus Martius. In 1881 the workmen busy on the foundations of the Tiber-embankment came upon the wreck of a bronze statue, supposed, as I have said, to be one of Domitian, and finally the statue which forms the subject of this letter was found on the 8th of February by the builders of the new national theatre on the brow of the Quirinal overlooking that part of the Via Nazionale of the actual city which joins the end of the Corso and the Piazza Venezia, or the southern extremity of the Campus Martius of ancient Rome. The site was that where stood Hadrian's Temple of the Sun and Constantine's Thermæ in close vicinity to each other, and the statue was found lying in a mass of débris, together with some drums of small fluted columns of tufa.

Its recovery, therefore, is an event of the highest artistic and archæological interest and importance. But more than that, it is the most important discovery of the kind that has yet been made, from the fact that it is the first complete bronze statue of undoubted Greek workmanship — that is, wrought in Greece by one of the great masters of antiquity and brought thence to Rome, probably a victor's trophy — that has yet been discovered in Rome, of all the works of all that crowd of sculptors who wrought in bronze, of whom Pliny, Pausanias and others have left us the names. It is an iconic nude statue of a victorious athlete standing erect. The weight of the body rests upon the right leg. The left is slightly flexed. His right hand is placed behind his back in the position of that of the Mercury of the Belvedere. His left is held aloft and his gaze is turned toward the right. The statue is fractured cleanly across the left shoulder and the right thigh. The left knee is broken across and some pieces detached, and the right foot is rather badly shattered; but all the pieces of the statue have been found, excepting only the index finger of the raised hand and the object that hand evidently held. The bronze, particularly as regards the head, arms, and body, is in a fine state of preservation, but the legs from the knees downward are a good deal corroded and incrusted. In point of art it is a grand piece of modelling, in which the hand of a great master has done justice to one of those splendid specimens of the human form in full training which the Olympian and other games offered to the Grecian artists. The model and the sculptor were worthy of each other. It would be difficult to overrate the physical symmetry of the one or the talent of the other. Like all the statues of victorious athletes — this is a portrait from head to foot, a lifelike, breathing portrait. The face is handsome and repleto with animation and individuality. The sockets of the eyes are hollow, the balls having been originally of smalt or other similar material. The frontal sinus is strongly developed, giving the forehead a somewhat retreating line, and the nose is slightly aquiline. The mouth and rounded chin are particularly well formed.

It is impossible to look upon this statue, and still more to examine

it in detail, without being reminded of Pliny's descriptions of the characteristic which marked the works of Lysippus. It answers to that description in every point. The head is small, and if the sculptor has flattered his model in any respect it has been by an imperceptible lengthening of the lower extremities- to be detected only by measurement, which gives the figure additional lightness. The details of the hair upon the head and body are rendered with peculiar care. The thigh especially and other fleshy parts are modelled with much roundness of treatment, while the planes are not neglected; moreover this statue is peculiarly remarkable for the careful manner in which even the smallest details are treated, as, for instance, the creases, or crease lines, on the neck, abdomen, and elsewhere, and the folds of the flesh under the knuckle of the little finger as it closes on the palm. This, briefly, is an exact description of the style in which this statue is wrought, and by turning to Pliny's "*Natural History*," lib. xxxiv., chapter 19, you will find that what he says of Lysippus's work tallies strikingly with it.

The treatment of the hair of this athlete is very remarkable. He is a young man around whose chin the razor has not yet played. The down on the cheeks and chin has just become soft, short hair, beginning from above the corners of the mouth. This is all delicately engraved upon the bronze in a variety of gentle curves which could scarcely have been better placed had each hair been studied. The hair under the armpits is treated in the same way. On the head the hair, cut short, is divided into slightly curved locks corresponding in style exactly to the treatment of the hair on the head of the marble copy of the Apoxyomenos by Lysippus, found in 1849, and now in the Braccio Nuovo of the Vatican Museum; but in this bronze each lock of hair has been carefully tooled over and finished with the graver. Above the pubes the modeling and treatment of the hair are the same, and that on the eyebrows is also well defined in relief. There is a marked similarity between the modelling of this statue and that of the Apoxyomenos, and taking all these things together I cannot but feel more than convinced that in this bronze we have before us a veritable original statue by Lysippus, the only one of the 1,500 bronze works he is said to have executed that has come to light.

In one respect, that of height, this bronze differs, so far as I remember, from the statues of other athletes. Those of which we have ancient copies, including the Apoxyomenos by Lysippus, are all of life size, while this stands six feet ten and one-half inches in height. If it were not so evidently a life-like portrait modelled from the man himself it represents, I should pronounce it to be that statue of Polydamas by Lysippus mentioned by Pausanias at the beginning of the sixth chapter of his sixth book, and who, he says, was the tallest man that had been seen since the heroic age, not excepting any race of giants there may have been before that. But Polydamas conquered in the Pancratium in the ninety-third Olympiad, and Lysippus flourished in the one hundred and thirteenth. We have no record of when Lysippus was born or when he died. That he must have lived to a great age would appear evident from his having made the extraordinary number of 1,500 statues, and he may have been well advanced in years when, according to Pliny, he flourished at the date of Alexander the Great's death. According to Pausanias, Lysippus also made the statue of the athlete Troilus, who conquered in the one hundred and second Olympiad. If Lysippus was seventy-five years old at the date of Alexander's death, he would have been thirty at the time when Troilus was victorious, and consequently quite old enough to have been intrusted with the making of his statue. This is quite within the bounds of possibility. But it was thirty-six years earlier that Polydamas conquered in the ninety-third Olympiad. Between that and the one hundred and thirteenth there is a lapse of eighty years, and it follows, therefore, that Lysippus could not possibly have made his statue until some thirty years or so after the date of his victory. At that time Polydamas, presuming that he was still alive, must have been a man of fifty at least. Lysippus could have measured his proportions, and, from his lineaments, with sufficient exactness have depicted him in clay as he appeared at the age of twenty. Moreover, he may have had the help of a painting of Polydamas executed at that age; but all this notwithstanding, the head and face are so strikingly life-like and the whole statue is so full of vital individuality as to make it difficult to suppose that it could have been modelled otherwise than direct from a man of the age it represents. But then, on the other hand, what may be difficult for me to comprehend may have been easy for Lysippus to accomplish. — *Letter to the London Times.*

Rome Dispatch to the *London Times*, April 4.

There is great excitement and rejoicing in the artistic and archæological world of Rome at the discovery of another life-size bronze statue of evident Greek workmanship close to the spot where the bronze athlete was recently found. It represents a pancratiast, a Greek prize-fighter reposing seated after the combat, his elbows resting on his knees, and his forearms and hands, with the cestus still on them, extended in fatigue one over the other. The statue is uninjured, with the exception of a fracture partly across the right thigh, from which a bit from the inside surface has been lost. The head, hands, and feet are perfect, and, judging from the cestus on the arms and hands, the work is one of great antiquity as well as of artistic interest and value. The discovery of two life-size bronze statues within a few weeks is an unparalleled event in the annals of art in Rome. It is believed that this statue and that of the athlete were purposely hidden where they have been found, and hopes are therefore entertained of further discoveries being made.

THE HISTORY OF WINDMILLS.



ATMOSPHERIC disturbances causing wind have from a high antiquity been employed as a motive power, and probably the earliest application of this force was the propulsion of ships by sails. Among the most primitive races, long before we made much progress, this power was applied in the navigation of small vessels; and the ancient Phœnicians, Greeks and Romans were all of them well acquainted with this mode of employing the force of the wind for the purposes of human industry. It is to be regretted that we have no records of the time when it was applied as a motive power in mills; this event is lost in the oblivion of the past, and it was not till early in the thirteenth century that we find the Dutch and French employed in the construction of windmills adapted to the wants of an energetic and industrious population. These times were marked by a growing intelligence, that encouraged and fostered inventive talent, and the Dutch millwrights and engineers were long celebrated for their skill and knowledge in every art that had for its object the improvement of the industrial resources of the people. The following account of their ancient history, as far as our knowledge extends, may not be uninteresting to the general reader.

When were windmills introduced into England? The Romans had land and cattle and water mills, but "it is very improbable, or much rather false," says Beckman, "that they had windmills," nor does there seem to be any sufficient ground for the common notion that Europe derived its windmills from the Saracens, through the Crusaders. It is after or about the date of the Norman conquest that we begin to hear mention of mills moved by wind in this quarter of the world. "They were first known in Spain, France and Germany," says one of the authorities quoted by Haydn, "in 1299." When were they first known in England? The "*Boldon Book*" of 1183 has frequent mention of mills; as, for example when it speaks of "Gateshead, with its borough and mills, and fisheries, and bakehouses, and with three parts of the arable land of the said town, renders sixty mares." But there is no direct description of the kind of mills which were in use. Though there were horse and water mills at that time, the "*Boldon Book*" affords us no glimpse of a windmill, with its revolving wands, lending a picturesque air to the scenery of the bishopric. In a volume, however, containing Hugh Pudsey's survey of the County Palatine (edited for the Surtees Society by the Rev. William Greenwell), there is also a roll of receipts and expenditures of the twenty-fifth year of Bishop Bec (1307), wherein, among repeated mentions of mills, there is specified distinctly not only a water but a wind mill.

From this it appears that we did not get our windmills from the Saracens, and the probability is that we had them on this side of Europe before they came into use on the other. It was not till 1332 that Bartolomeo Verde proposed to the Venetians to erect a mill to go by wind; and a site was only granted to him on condition of its surrender if his experiment should fail. Windmills were probably scant at the close of the eleventh century, when the Crusades broke out; but in the twelfth they began to be more common, and "a dispute arose whether the tithes of them belonged to the clergy" — a question which Pope Celestine III very naturally, and not unreasonably, determined in favor of the Church.

An ingenious writer in the *Practical Mechanics' Magazine* states that "about seventy years ago a master mariner residing at Dunbar, in Haddingtonshire, devised a novel windmill on the horizontal construction. It consisted essentially of an upright shaft, which carried four arms, at the extremities of which were four masts rigged with try-sails, and the sheets were adjusted so that the sails might take their proper positions, according as they were acted on by a beam wind, 'booming out,' or coming up in the 'wind's eye.'" A mill so constructed would not possess the important element of durability, as the violent jerks imparted to the sheets would very soon snap them. Several mills on the horizontal construction were in use at the town of Eli, in the litigious kingdom of Fife, at the end of the last century, and were employed in grinding indigo, but they have long since been removed.

About three or four centuries ago, the avaricious landholder, favored by the meanness and injustice of Government and the weakness of the people, extended their regality or kingship not only over all streams, but also over the very air and mills which it impelled, so that small proprietors, before erecting a windmill upon their own property, had first to obtain permission from the superior of the province before doing so. The early mills were immovable, and

could only work when the wind was in one quarter; they were afterwards placed, not on the ground, but on a float which could be moved round in such a manner that the mill should catch every wind. This method gave rise, perhaps, to the invention of movable mills. To turn the mill to the wind, two methods have been invented and are in common use; in the one the whole structure is arranged so as to turn on a post below, and in the other the roof alone, together with the axle and the wings, is movable. Mills of the former kind are called German mills; those of the latter Dutch mills. They were both moved round either by a wheel and pinion within, or by a long lever without, which acted as a stay to the structure, and which was sometimes connected at its extremity to a cart-wheel, in order to facilitate its movement horizontally.

During the period of the Crimean war, Sir William Fairbain had an opportunity of examining several of the windmills in European Turkey and also in the Crimea. Speaking of these, in his "*Treatise on Mills and Mill-Work*," he says that around the town of Eupatoria, in the Crimea, there appeared to be nearly two hundred windmills, chiefly employed in grinding corn. All which were in a workable state were of the vertical construction, save one horizontal mill, which seemed to have been out of use for at least a quarter of a century. The tower of this mill was built of brickwork, about twenty feet diameter at the base, and about seventeen feet at the top, and twenty feet high; the revolving wings, which consisted of six sets of arms, appeared to be about twenty feet diameter, and about six feet broad, fitted with vertical shutters, which were movable on pivots passing through the arms, the shutters being each about twelve inches wide by five or six feet high, and the pivots were fixed at about one-third of the breadth from the edge of the shutter, in order that the wind might open and shut them at the proper time, during the revolution of the wings. About one-third of the circumference of the wings was surrounded by a segmental screen to shelter the arms and shutters while moving up against the wind, and the screen seemed to have been hauled round with ropes, in order to suit the direction of the wind.

Sir William Fairbain also examined one of the most recently-erected mills on the vertical construction, which had the words "*Moulin Français*" inscribed upon the door, by way of recommendation. The tower of this mill was also of brickwork, and appeared to be eighteen feet in diameter at the base, and about fifteen feet at the top, and about twenty-two feet high. The four wings were about thirty-five feet in diameter, and of a rectangular shape, about fifteen feet long and five feet broad. The surface exposed to the wind was increased or diminished by the application of canvas sails, whose spread could be raised by reefing or twisting up the extreme end of the sails when the mill was in a state of rest. The main axle, which was octagonal in form, was constructed of oak, about fifteen inches in diameter at the neck, and about ten inches at the rear end. The front of the axle, which received the arms, was square, and the two pairs of arms did not intersect the axle in the same plane, the one pair being in advance of the other. All the arms butted against the axle and were united to it by side pieces, which were securely bolted to the arms and through the axle, which rendered mortising unnecessary, and preserved the strength of the shaft. The bearing in which the neck of the axle revolved seemed to be formed of some hard wood, probably lignum-vitæ, and was lubricated with soft-soap and plumbago. The rear end of the shaft was fitted with an iron gudgeon, about three inches ni diameter, secured by iron hoops and wedges. About the middle of its length this axle carried a face-wheel about four feet in diameter, which was constructed entirely of timber; its arms were mortised through the axle, and secured by iron hoops round the rim, which formed the bearing surface for the friction strap or brake for arresting the speed of the mill. The teeth of this wheel, which were about three and one-half or four inches broad and four and one-half pitch, geared into a trundle or pinion about fourteen or fifteen inches diameter, fixed on the top of a long, vertical wrought-iron shaft, about two and one-half inches square, which was coupled at its lower extremity to the rhynd on the top of the millstone spindle, the long shaft being steadied by a bearing near the centre of its length to prevent any jarring or vibration being communicated to the revolving millstones.

When Sir W. Fairbain visited the mill, the miller was engaged in laying on the revolving stones; he was thus enabled to see the working faces. The millstones were about three and one-half feet in diameter, and were formed of a single stone, similar in appearance to the white silicious burr obtained from the quarries near Rouen. The stones were not indented with roads and channels to assist in grinding and throwing out the flour, but were simply roughened or cracked with the miller's pick. The neck of the millstone spindle was guided by a bushing of hard wood, with the fibre endways — a mode of bushing employed for more than half a century in the flour mills of this country, and which, no doubt, gave the idea to Mr. Penn, of Greenwich, for his mode of bushing the screw-shafts in our modern steamers, and which was better than gun-metal in situations precluding the use of unguents. When the mill was set going, the wings, which were thirty-five feet diameter, performed twenty-nine revolutions per minute, when loaded, and the extremity of the sails acquired a velocity of about thirty-two thousand feet per minute, or nearly thirty-five miles per hour, and which showed that the "Crim Tartars" knew the importance of letting off their prime movers. It is more than probable that we are indebted to the Dutch for our improved knowledge of windmills and wind as a motive power. Half a century ago nearly the whole of the grinding, stamping, sawing and draining was done by wind in the flat countries, and nearly the whole of our machinery depended on wind, or on water where the necessary fall could be secured. These sources of power, however, are gradually being abandoned, and wind as a motive power of any great importance may be considered as a thing of the past. — *Iron Age.*

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

COMPETITIVE DESIGN FOR A COUNTRY STABLE. DESIGN SUBMITTED BY "*Old Apple-Tree.*"

THE stable contains two stalls for horses and one for a cow. The latter has been arranged so that any moisture from it runs off without the possibility of affecting the horses' bedding. The back door gives convenient access to the paddock and the manure-pit. Off the stable is a room in which stands the harness-case and the stove. This room may also serve as a tool-house and feed-room. An upper floor, the height of which from the ground-floor is eleven feet three inches, affords space for the storage of food for the cattle. The opening into this floor is above the coach-house door, so that loads may be backed up close under it. The man's room is on this floor, immediately over the harness-room; the floor of this room can thus be made air-tight and comfortable, being isolated by the partitions from the rest of the building. The entry of fresh air has been considered as amply provided for where so many doors and windows are at disposal. For the egress of the deteriorated air from the stable there are, besides the openings above the hay-racks, three openings above the stable passage. These are protected by wooden gratings (see details), which may be removed when straw for bedding is to be thrown into the stable. The upper story has free communication with the outer air through the large ventilator in roof. Besides the excavation necessary for the barn proper, a pit is required for the underground cistern. The digging for manure-pit is also included. The foundation walls and the back and sides of manure-pit are to be of local stone. The manure-pit wall is to be built in cement, the bottom of concrete six inches thick. The sides and bottom are to be lined with hydraulic cement. A four-inch bed of gravel and cement concrete is to be laid on rough boarding of wash-rack in coach-room and covered with asphalt. The rain-water cistern is to be six feet deep and six feet inside diameter, built of brick (eight inches thick) in cement, the bottom to be concrete, the whole to be lined with good hydraulic cement. Overflow-pipe to be furnished leading to a dry well at a point isolated from other waste. The lumber to be spruce, well seasoned and of best quality. The floor-beams, rafters, studs, etc., to be of dimensions shown on drawings. The interior is to be finished with vertical sheathing. The exterior is to be finished with shingles dipped in creosote. All doors, except where shown otherwise, are to be battened. All windows are to be double-hung, except where otherwise shown. The stable-fittings are to be iron; the finals are to be of wrought-iron, as designed. All the details indicated on the drawings are to be done in the most thorough manner.

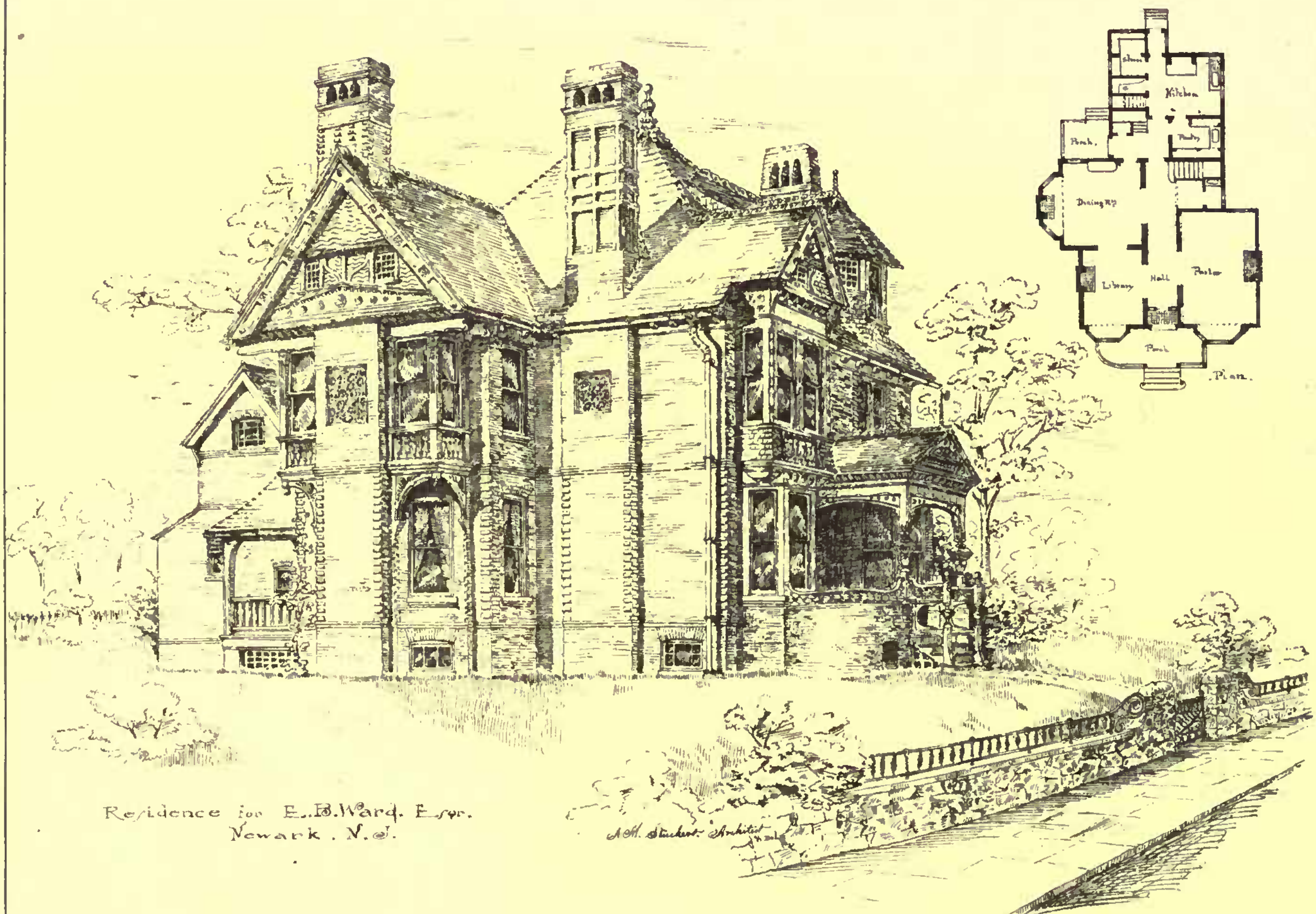
The affixed estimate has been furnished by a builder in Boston. The signed estimate is in the possession of the author of the design.

ESTIMATE.

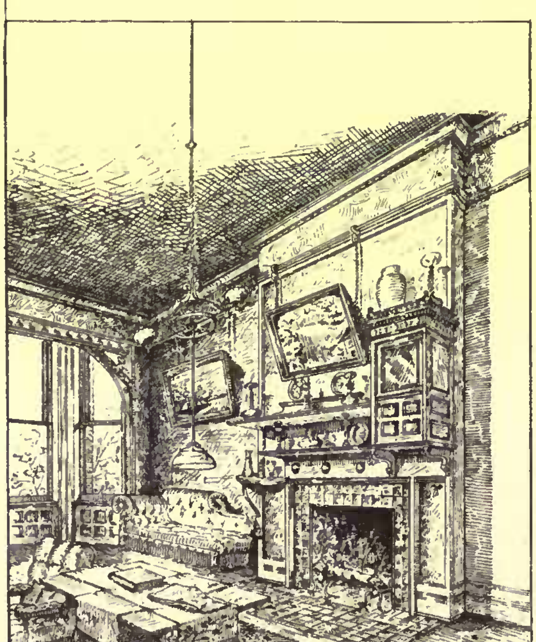
60 yds. excavation, at 30 c.	$18.00
40 perch stone (laid), at $3.50	140.00
2,000 bricks (laid), at $18 per M.	36.00
7,000 ft. spruce frame (in place) at $23	161.00
2,500 ft. spruce plank, first floor	75.00
1,300 ft. spruce boards, second floor	40.00
2,000 ft. spruce sheathing	75.00
3,500 ft. hemlock boards (laid)	75.00
2,500 shingles (laid)	125.00
12 windows	75.00
1 large door outside	15 00
2 small doors outside	20 00
3 inside, finished	15.00
1 flight stairs	20 00
3 small sashes in stalls	5.00
Iron-work for stalls	35.00
Outside finish	50.00
Ventilators	55.00
Finials	15.00
Pump and plumbing	50.00
Gutters and conductors	39.00
Carriage-wash	28.00
Manure-pit	85.00
Painting	125.00
Total	$1,377.00
Architect's fee	68.55
	$1,445.85

HOUSE FOR E. B. WARD, ESQ., NEWARK, N. J. A. MORRIS STUCKERT, ARCHITECT, NEWARK. N. J.

THIS house has recently been finished. It is built of selected Hackensack brick, laid in red mortar; has slate roof with galvanized-iron cresting and finials. The interior is finished with white-wood stained mahogany, and has a cabinet finish. The stairs are solid cherry, and the vestibule of quartered oak, with tiled floor. The mantels are of hard wood, cherry and ash. The entire cost is $11,-000.



Residence for E. B. Ward Esqr.
Newark, N. J.



Library

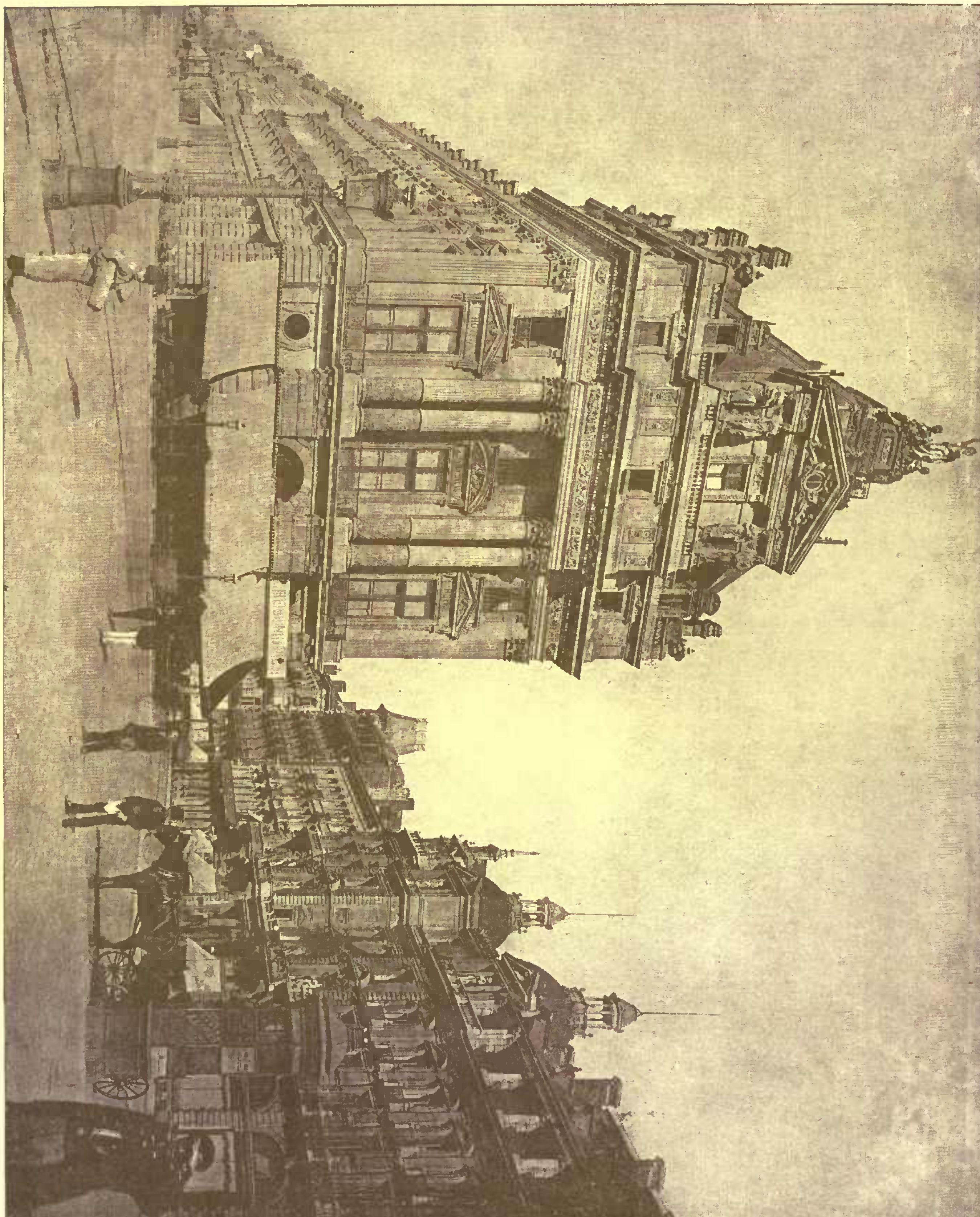


Hall

Interiors of House for E. B. Ward Esqr

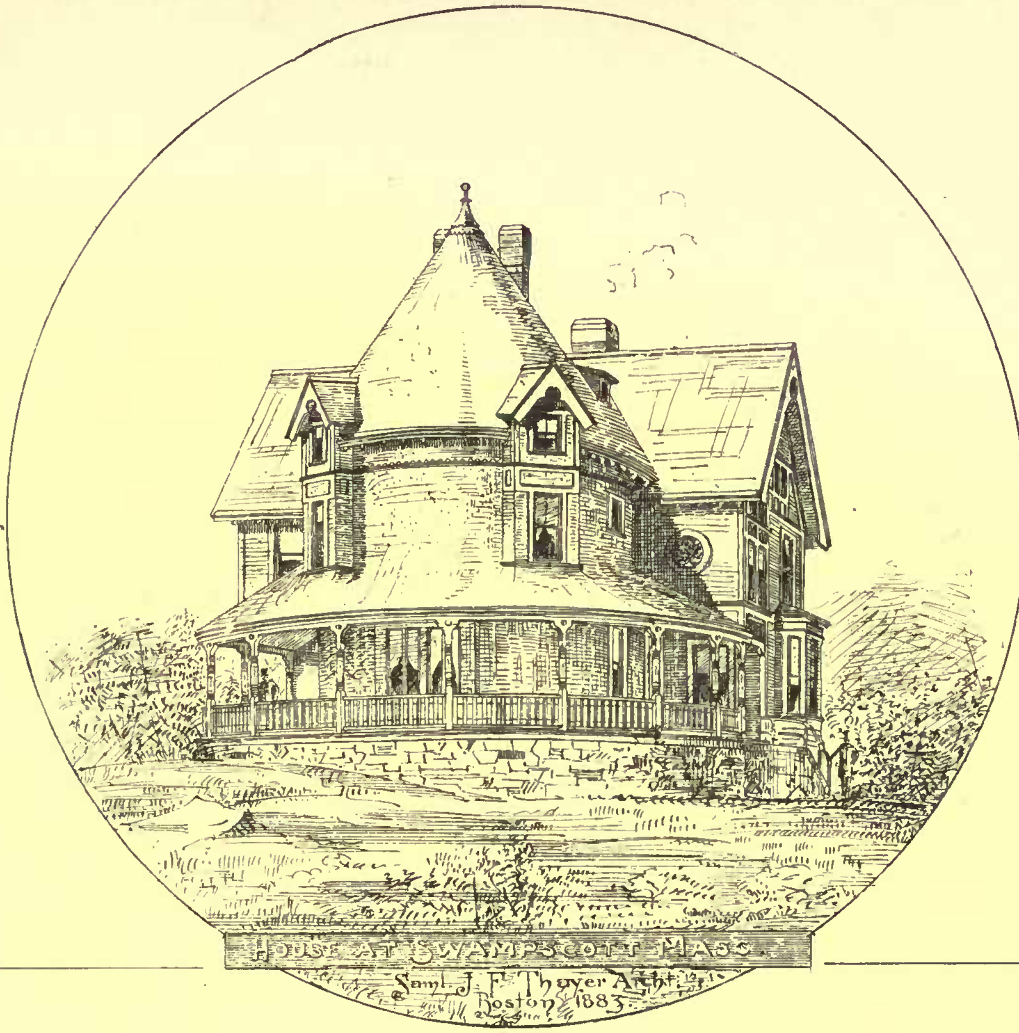
A. Morris Stuckert, Archt.
Newark, N.J.

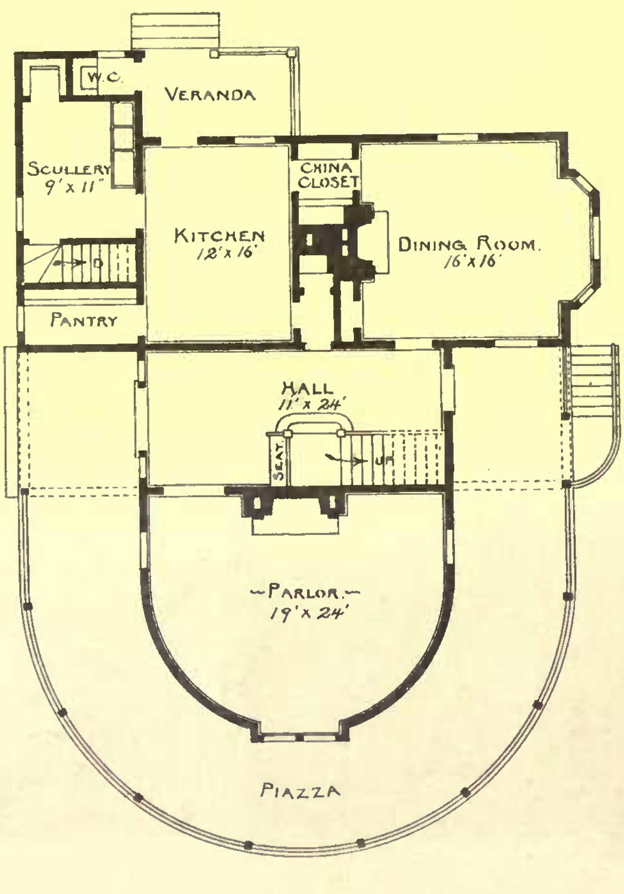
No. 489 American Architect and Building News, May 9 1885



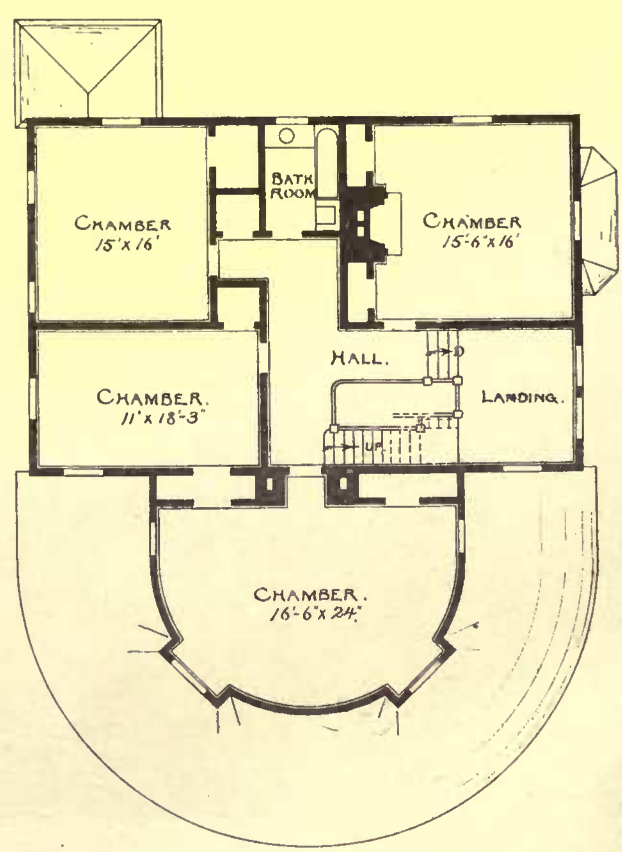
Continental Hotel, Brussels, Belgium. - 1884

HELIOTYPE PRINTING CO. BOSTON



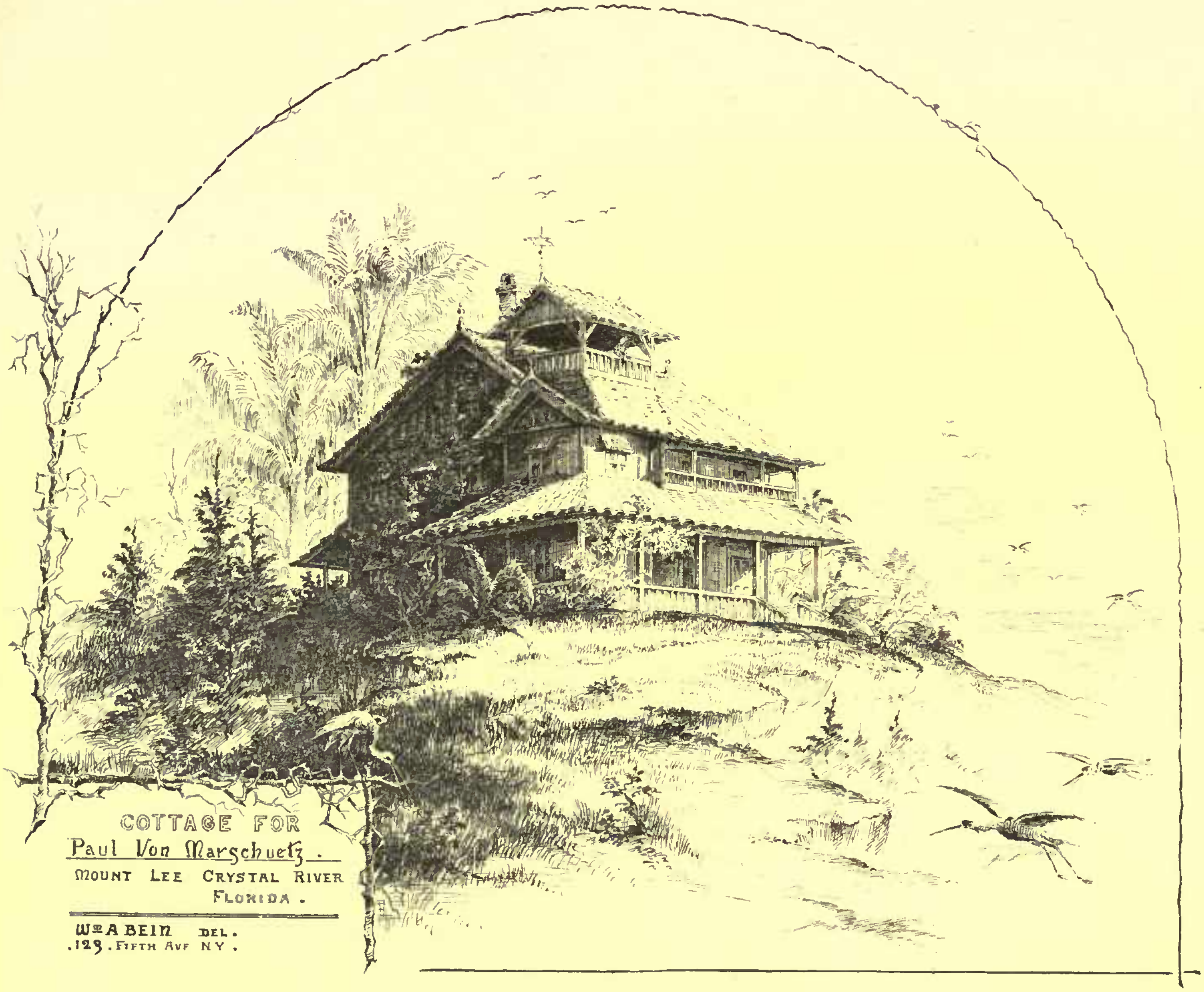


FIRST FLOOR PLAN



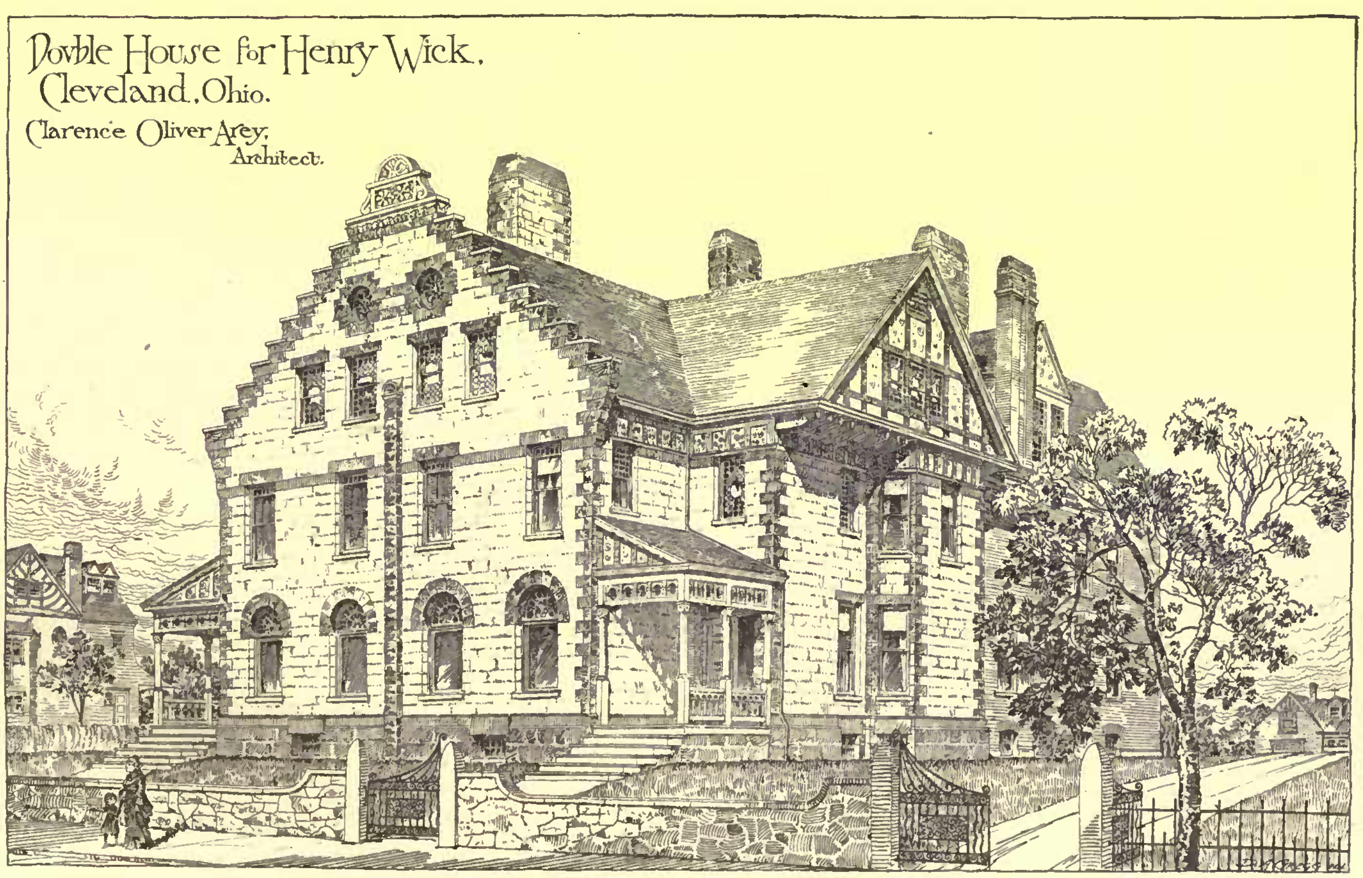
SECOND FLOOR PLAN

HELIOTYPE PRINTING CO. BOSTON



COTTAGE FOR
Paul Von Marschuetz.
MOUNT LEE CRYSTAL RIVER
FLORIDA.

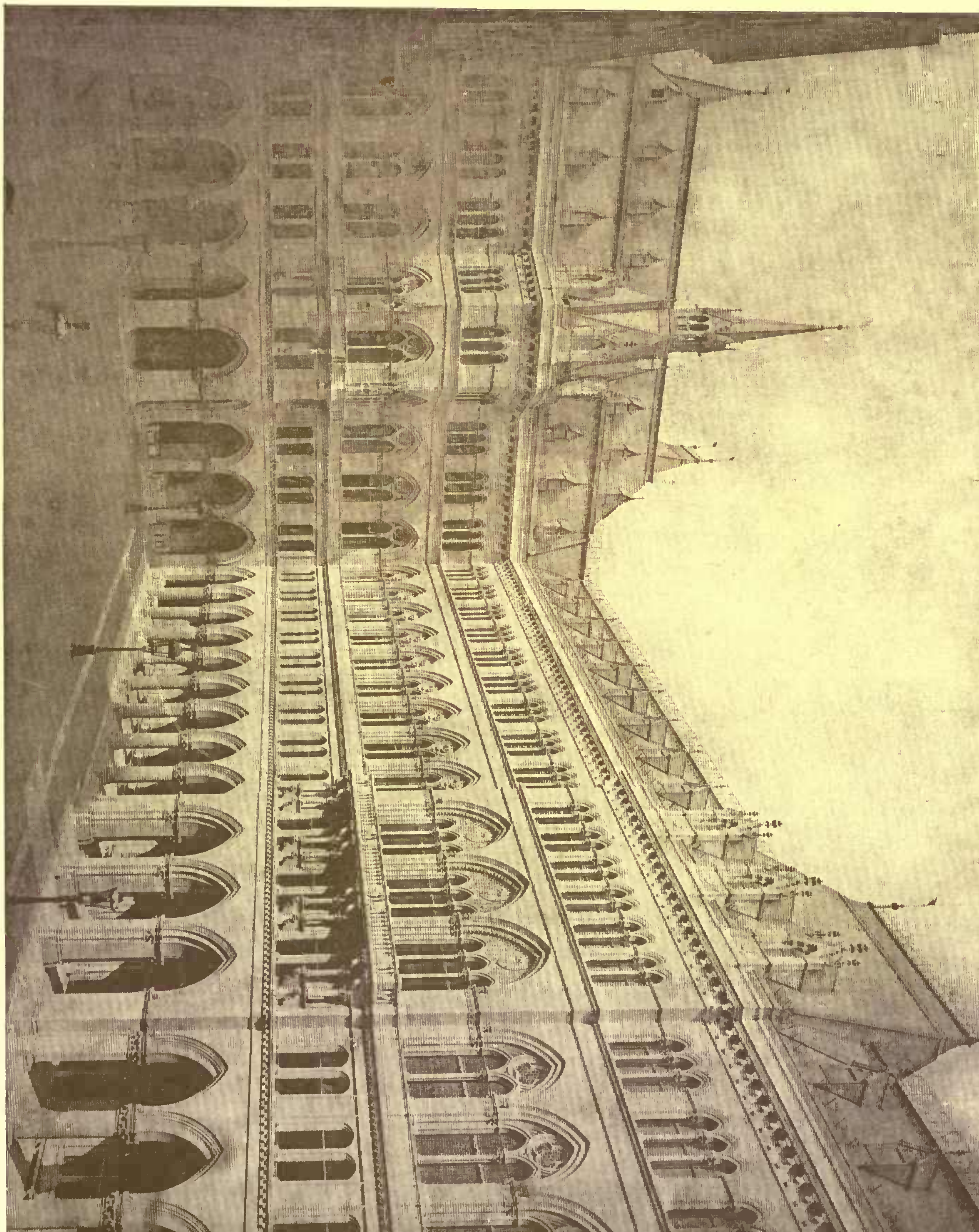
WM A BEIN DEL.
.129. FIFTH AVE NY.



Double House for Henry Wick.
Cleveland, Ohio.
Clarence Oliver Arey,
Architect.

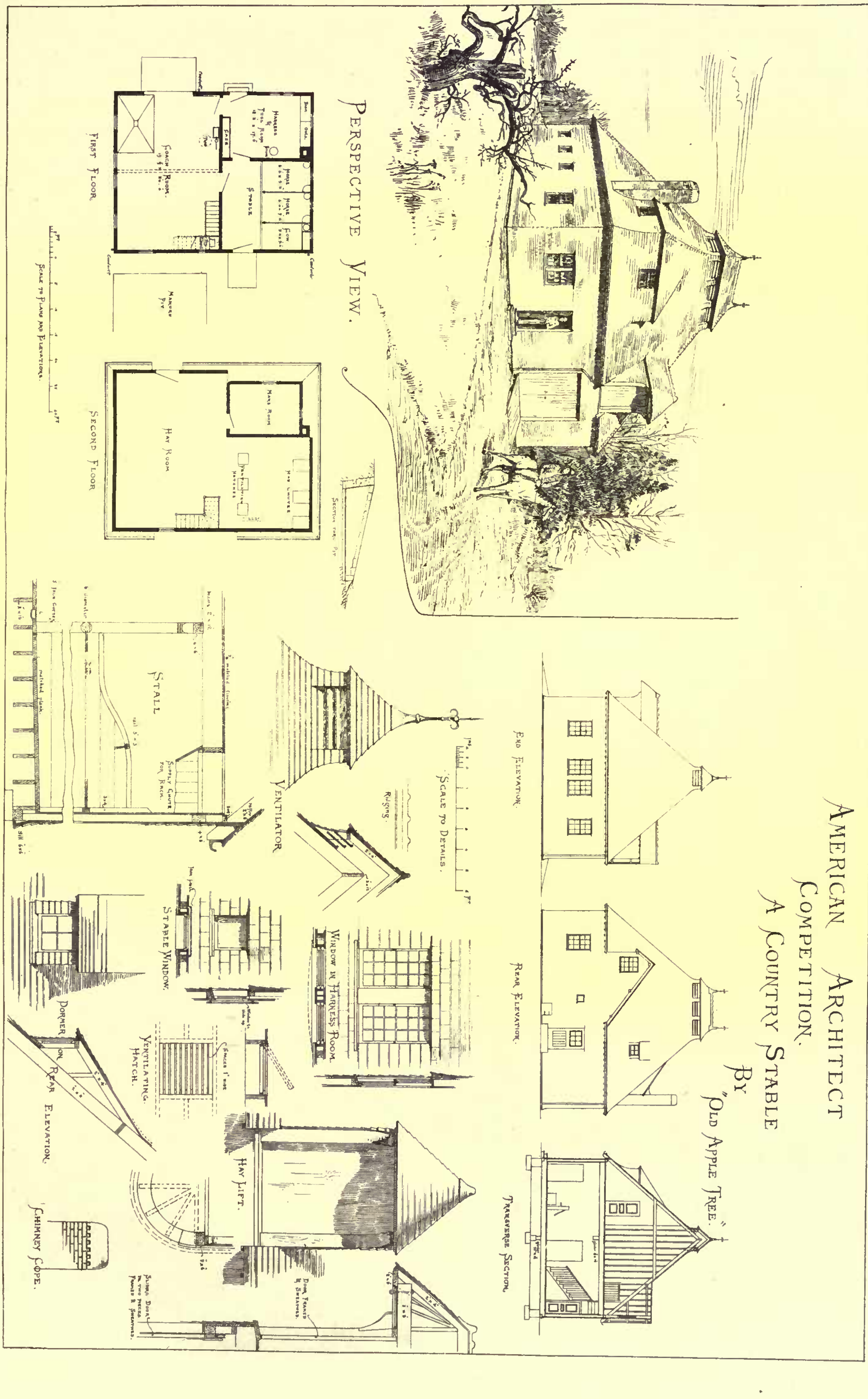
HELIOTYPE PRINTING CO BOSTON

American Architect and Building News, May 9 1885 No. 489



New City Hall, Vienna, Austria, - 1884.
Façades on the Court-Yard.

HELIOTYPE PRINTING CO BOSTON



HELIOTYPE PRINTING CO BOSTON

HOUSE AT SWAMPSCOTT, MASS. MR. SAMUEL J. F. THAYER, ARCHITECT, BOSTON, MASS.

THIS house was built at the junction of Atlantic Avenue and Orient Street, last year. The construction account shows its total cost to have been $7,617.90.

COURT-YARD OF THE RATH-HAUS, VIENNA, AUSTRIA. HERR FRIEDRICH SCHMIDT, ARCHITECT.

SEE in the *American Architect* for July 19, 1884, the article on the "New Buildings of Vienna."

THE CONTINENTAL HOTEL, BRUSSELS, BELGIUM.

COTTAGE FOR MR. PAUL VON MARSCHUETZ, MOUNT LEE, CRYSTAL RIVER, FLA. MR. WM. A. BEIN, ARCHITECT, NEWARK, N. J.

HOUSE FOR HENRY WICK, ESQ., CLEVELAND, O. MR. C. O. AREY, ARCHITECT, CLEVELAND, O.

PLASTER IN SCULPTURE. — I.



THE wide-spread interest now taken in art matters is general, but especially the attention which is being devoted to the collecting of reproductions of great masterpieces of sculpture, emboldens me to beg space in your columns for a few facts concerning plaster casts and their use as a medium of artistic expression. Even in the glorious days of classic art this usage was not unknown. In an old Greek workshop in Sicyon, in the age of Alexander the Great, casts were taken from the living face, according to story, with a view to exact portraiture, and artistic remains in plaster discovered of late years on Greek soil show that plaster casts at that time embraced a still wider range and were employed for ideal subjects. Several centuries later, could we have looked into the libraries of Roman philosophers who were too poor to indulge in marble or bronze, we should have found them decorating their book-shelves with busts in plaster of their great forerunners — Plato, Democritus, Zeno and others. During the following age, the one between these philosophers and the revival of art in the fifteenth century, there is great obscurity as to the use of casts in plastic art. If, however, we could have visited, about the middle of the fifteenth century, the workshop of the quaint Florentine master, Andrea Verrochio, we should have found him studying nature through this medium. By 1531, less than a century later, plaster casts of celebrated Roman statues were transported from Italy to far-off France, to decorate the capital of Francis I. In the days of Louis XIV, the agents of that monarch, artists and skilled workmen, collected in Rome similar reproductions of the finest statuary there, and how ambitious their task appears from the fact that they brought back the huge bulk of Trajan's column cast in metal! But the munificence of two citizens of the Venetian Republic appeals still more strongly to us Americans. We do not know the name of the patrician who, in 1670, opened to students the ground-floor of his palace, supplied with casts, but it was Filippo Farsetti, who, in the eighteenth century, carried out this plan on a more generous scale. This noble Venetian, in the course of his extensive travels, collected casts of the then known sculptural works of antiquity, and placing them in his sumptuous palace, threw it open to the use of the public. His hope that it would elevate the taste of his townsmen could not have been disappointed, for in the dry old archives it is pleasant to find that the palace was much visited, and that there many artists studied. Out of these generous acts there sprang in time the present Academia delle Belle Arti, thus making all lovers of Art, of a later day as well, debtors to these public-minded old Venetians. How wide-spread was the appreciation for reproductions of antiquity in casts during the last century appears also from the intense activity of Raphael Mengs. This artist sent to Charles III, of Spain, for the Escurial, one hundred and twenty great boxes, containing casts of many statues in Rome, and for his own private use made a still larger collection, numbering eight hundred and thirty pieces. After his death these passed into the hands of Frederick Augustus, Elector of Saxony, who removed them to Dresden, where they formed the nucleus of the present stately collection, and inspired such great men as Lessing and Goethe. Seats of learning, too, had long felt the great importance of ancient monuments, especially in connection with the study of the literature of the past. Wolf, the father of modern philology, in the days before railroads had made transportation easy, borrowed for his lectures at Halle all the monuments he could obtain from Berlin. But such an awkward system of illustration could not long suffice to meet the wants of an advancing science, and in 1827, under the guidance of the great Welcker, Bonn took the lead, in making for its university a collection of casts taken from the best subjects then known. The shining example of Bonn has been followed slowly but surely by the majority of its sister universities in Germany. As concerns equipment and abundance of space, perhaps none have been more generously fitted out than the youngest among them, the new university at Strasburg.

Above all collections of casts, however, towers pre-eminent the one in Berlin, formally opened to the public in 1856. Here classical antiquity alone was first represented, but the art of the Middle Ages and of the Renaissance have since been added. This collection, started in the early part of this century, under the generous patronage of the kings of Prussia, and watched over in its growth by such men as Wilhelm von Humboldt, Tieck, Gerhard, Bötticher, and Conze, has now grown to colossal proportions.[1] It now offers a well-nigh complete survey of all the important sculptural monuments preserved to us from classical antiquity, and the vacancies in other departments are continually being filled. Casts from such gigantic groups as the Farnese Bull and Monte Cavallo Horse-Tamers, from marbles discovered in Greece, Asia Minor or Italy, or found in the numerous museums of Europe, and even from tiny bronzes, all are here. New arrivals continually swell the mighty assemblage, and bring delightful surprises to the eye of the student. Especially in monuments from Greece, the Islands, and Asia Minor is the collection now beautifully rich; no discovery of any importance, whether from the infancy of art, its full prime, or even its decrepit decline, being overlooked.

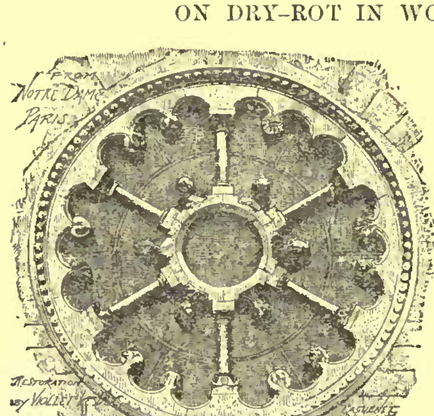
To collect so much art material, not only time and money but much profound knowledge have been requisite. Many able minds have been concerned in the work, and trained scholars have been sent out to superintend these selections, which now, in stately numbers, supplement the originals in the galleries. Thus, in early days, such men as Bunson, the author of that great work, "*Beschreibung der Stadt Rom*," were active in this direction. In later times, Schaubert in Greece, Aumann in Asia Minor, Brunn and Helbig in Italy, Hübner in Spain, and Hittorf in Paris, have carried on the work for Classical antiquity, and many others equally able have represented the art of the Middle Ages and of the Renaissance. The satisfactory arrangement of this vast collection, representing every age of art as well as many mythological subjects, is a work of supreme importance and of the greatest difficulty. A grouping according to mythological families was at first attempted, but was found to be lacking in a firm scientific basis, as well as in elasticity. Accordingly historical grouping, originating with Welcker at Bonn, and followed by all the Continental collectors, is now also employed by the Berlin Museum. But, of necessity, the overcrowded halls do not allow this plan to be strictly carried out, and as the motley assemblage now stands, on entering we find many Roman and Greek portrait-figures and busts, followed by Roman triumphal and tomb monuments. Close upon these comes the stately hall where Dionysius languishes among his merry followers, and where Aphrodite exercises her charms; Niobe and her family are together with the Samothracian Nike, Praxiteles's Hermes, and many other sturdy athletes; the stern Athene shares her circular hall with Heracles, and with the different groups of Menelaus bearing the dead Patroklos. In the Greek *Saal*, temple sculptures from Athens and Ægina keep company with humbler tomb and votive monuments from Greece and far-off Lycia, while in the gallery of the north court are many specimens of very early art, together with the most recent and varied acquisitions from Asia Minor. Fully to satisfy scientific demands, the collection soon required a reliable and full catalogue. This was completed by the lamented Friederichs in 1868, under the title, "*Building-Stones for the History of Art*," and the wide-spread use made by scholars of this modest but gracefully erudite volume has long since proved its right to such a name. The collection has, however, so lustily outgrown the limits of Friederichs's work that his guide has recently been much enlarged, and offers, when used in connection with the monuments, an unrivaled means of education and entertainment.

Great importance is well attached to the faultinesses of the execution of all these casts. The raised lines, which always show the union of the different pieces of a mould, are never removed, for fear of injury to the surface, but are kept as fine as possible, so that, in most cases, only close inspection will reveal the gossamer-like threads. As many valuable objects in different parts of the world were not to be had in casts, the Berlin Museum early took the most praiseworthy but costly step of having moulds of all these formed and sent to Berlin. The casts made from these were primarily intended for the museum, but many have been generously presented to poorer institutions, and others sold. In consequence of the great development of the institution, the single room which originally formed the workshop has now grown to an extensive factory and storehouse, called the Formerei, and occupying a large quarter in old Berlin. Plaster-of-Paris, the material used, is, as is well-known, easily disfigured, harboring with greedy hospitality every particle of dust. The feather duster, in constant requisition in most museums, causes the cast soon to become so spotted and mottled that it is impossible to restore its pristine purity without destroying the fine outlines and characteristic surfaces which go to make up the very soul of the work of art. In view of such inherent weaknesses in the material, the Berlin Museum authorities have sought for some method of protecting their collection against its insidious enemies. To this end it was not unusual, many years ago, to paint the whole surface of each fresh cast with a coating of light oil-color. This could be washed

[1] *Vid. Zur Geschichte du Königlichen Museen* in Berlin. *Fest Schrift zum Feier ihren fün fozig jährigen Bestchens am 3 en* Aug. 1830. pp. 123.

with soap and water; but alas, it hid every fine tracery of veins and inimitable delicacies of surface treatment, so often the great charm in ancient monuments. Finally, however, chemistry was called in to their aid, and following up studies made by Reissig, Leuchs and Filsinger, Herr von Dechend has at last succeeded in producing a liquid which, on being applied with a machine of his own invention, makes the frail cast durable and capable of being constantly cleaned, without the slightest detriment to its artistic worth. With this remarkable discovery the last great step has been taken toward rendering casts a most desirable acquisition. The machine used is small and easily wheeled from place to place in the museum, where it may be seen every Monday doing its weekly cleaning. On other days it is employed for the more serious work of preparing the new casts for their place in the collection. This is done by saturating with a chemical solution, applied in the form of spray. This process, while hardening the plaster so that it becomes resonant like bell-metal, and impervious to dust and moisture, does not change the bulk of the statue in the least, and hence leaves unaltered every delicate form and outline. For supplying the immense demands of so large a collection, it is of course impossible to use in every case the most expensive kinds of plaster, and it is a fact that the grain of many monuments in Berlin plaster is not as fine as that of others made from the plaster coming from Paris, without doubt the finest material in trade, while that coming from Munich ranks next. In the Berlin Museum are also casts from many other parts of the world, another reason for the great variety in the plaster represented. Von Dechend's experience has been that the finer the quality of the plaster the more perfect the effect produced by his new process, and hence slight variations in color and smoothness noticeable among the monuments of the Berlin Museum. After the cast is thus prepared for its public life, it requires, for two decades at least, only an occasional dusting to keep it in pleasing condition, and the application of Von Dechend's treatment with chemicals will at once bring back its former purity. In dusting, the new machine is again brought into requisition, attacking each object with a powerful current of compressed air. It is interesting to watch the best secreted particles of dust start guiltily from their hiding-places when this searching stream finds them out. But more remarkable still is the effect upon a painted and sorely soiled cast when there is applied to it by the same machine Von Dechend's "mineral soap." Now the dirt rolls off in such masses that one fears for the delicate forms underneath. But after the final cleansing stream has passed over the surface, we are convinced of the groundlessness of our apprehensions, and possibilities for the use of plaster, not only in enriching public collections but also in beautifying house decoration dawn upon us as never before. The fact that this one machine in Berlin is obliged to do triple duty, being used in the Formerei, the Royal Museum and the Gewerbe Museum, is a further proof of its efficiency.—*Lucy A. Mitchell in the New York Times.*

ON DRY-ROT IN WOOD.



In the Public Health Section of the late meeting of German Naturalists and Physicians at Magdeburg, Dr. Poleck, professor at the University of Prague, read an interesting paper on the life history of the fungus known in this country as "dry-rot," and by botanists as *Merulius Lacrymans*, the ravages of which have of late years assumed alarming proportions wherever the building of new houses has been extensively carried on, but in Germany especially have become a question of almost national importance. For its prevention a knowledge of its life history and habits is absolutely necessary, and these researches may also serve to explain the curious fact that, while it rarely attacks the timbers of the oldest buildings, it has seriously endangered the stability of many erected within the last few years.

Its original *habitat* is not known, for it does not attack living trees, nor is it ever seen in decaying wood in forests. It is found, so far as we are aware, only in the timber of houses, chiefly, if not exclusively, in deal and pine. The name "dry-rot" is not quite appropriate, for a certain dampness and darkness are necessary for the development of the spores. These give origin to a mycelium of elongated cells, which spreads with surprising rapidity, covering the surface of the timbers and walls with fan-shaped expansions, and penetrating the cylindrical fibres and cells of the wood, break it down by a chemical action into a light brittle mass. Complete desiccation of the mycelium permanently destroys its vitality. Though at first developing only in the dark, it seeks the light for the purpose of sporiferation. The sporangia, which have a reticular structure, vary in size from that of a lentil to that of a shilling, and exhibit a somewhat concentric arrangement of cushiony folds, at first of a wine red, and lastly of a dirty brown color, when they exude drops of a clear fluid, whence the specific name of *lacrymans*. After emitting vast numbers of cinnamon brown spores, not more than .01 mm. in diameter, the sporangia become black, dry up and die.

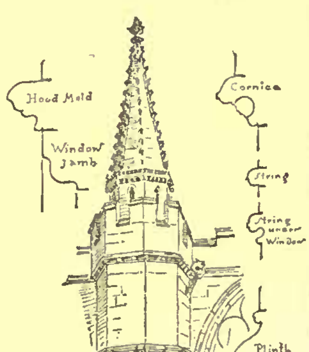
In the art schools attached to the Breslau Museum the mycelium has spread from the foundations to the wall plates, and the casts and models are covered with the dust-like spores. Some of the threads have been found to measure as much as five or six yards in length. Dr. Poleck has not succeeded in cultivating it artificially, but another investigator, who has not yet published the result of his experiments, is said to have been more fortunate.

The chemical composition of the *merulius* does not differ much from that of similar fungi. The water varies from fifty to seventy per cent, while of the dry substances five per cent is nitrogen and fifteen fat. There are, besides, acids, a bitter substance, and indications of an alkaloid. The mineral constituents, among which potassium and phosphoric acid are the most important, throw more light on the action of the fungus on the wood, which, as we have said, is not properly decay, but a chemical disintegration in consequence of the abstraction of these elements of its composition. As these are exhausted, the mycelium spreads outwards, much in the same way as the so-called "fairy-rings" are formed.

A clue is thus afforded to the increased prevalence of dry-rot of late years. It is well known that to facilitate the removal of the bark the practice of felling timber during the spring and early summer has become very general, and analysis has shown that the wood of coniferous trees at that season, besides being more watery and difficult to dry, contains five times as much potash and eight times as much phosphoric acid as in winter, conditions highly favorable to the development of the fungus.

If the use of such wood cannot be avoided it should be thoroughly seasoned and dried, if need be, by artificial heat. The use of old building materials should be shunned, and infected or supected wood be burned. In the absence of experiments on the artificial cultivation of the *merulius* we are without any exact knowledge of the relative value of the several reputed preservatives, but since dampness is an essential condition of its growth, the importance of maintaining the utmost possible dryness of foundations, joists, and floorings by means of concrete or asphalt, *efficient* damp-proof courses, and thorough ventilation, is obvious. It is scarcely necessary to observe that the treatment of wood-work with arsenical or mercurial solutions is fraught with the gravest dangers to health, however successful in their immediate object. If chemical preservatives must be used they should be restricted to one or another of the products of the distillation of tar though in this, as in other things, prevention is better than cure.

REFLECTED SOUND IN BUILDINGS.



Various instances are given of the mixture of direct and reflected sounds. In the gallery of the Bourse at Paris the confused vociferation of the multitude below is mentioned by Professor Tyndall, who says, You see all the motions of their lips as well as of their hands and arms; you know they are speaking, but you hear them not. Their voices mix with their echoes into a chaos of noise. It is well known that an audience and furniture both materially deaden the echo. Thus the same authority refers to a lecture delivered in the Senate House of Cambridge, where his voice was not heard at a distant part of the hall. "The assembled audience, however, so broke up and quenched the sonorous waves, that the echoes were practically absent, and my voice was plainly heard in all parts of the Senate House." In St. Alban's Cathedral, the tick of a watch can, it is said, be heard from one end to the other.

In Gloucester Cathedral a gallery of an octagonal form conveys a whisper 75 feet across the nave. The whispering-gallery of St. Paul's is a well-known instance of echoes. The well at Carisbrook Castle, in the Isle of Wight, which is 210 feet deep and 12 feet wide, lined with smooth plaster, is a wonderful conveyer of sound; a pin dropped into the well can be distinctly heard. Sound is not only reflected, but is refracted like light, and may be condensed; it can be diffracted or bent round obstacles. Echoes are reflected waves. Echoes may be prevented by cutting off the angles of the room with drapery, by wires stretched across the room to break the waves of sound, and, in fact, by any device which will interrupt the reflection of the sound waves. The method of demonstrating the reflection of sound is by the use of two parabolic reflectors placed opposite each other with their centres in a line; a sounding body is placed in the focus of one of the reflectors, and the sound waves striking the nearest reflector are thrown by reflection to the farthest reflector, and is then concentrated to its own focus, so that an ear placed in this

second focus distinctly hears the sound made at the initial point. A vertical wall without break behind the sound and not far removed from its source, resembles a reflector, and is sufficient to cause an echo. Either a recess or a gallery may tend to break this reflection. Unfortunately treatises on sound seldom enter into the question of the means to be taken to remedy echo or promote the transmission of sound in buildings. In large assemblies the principle of the isacoustic curve, one of equal seeing and hearing, appears to give the best results in the arrangement of the seats of the auditors. — *The Building News.*

SUB-LETTING PLUMBING CONTRACTS.

THE Cincinnati Chapter, A. I. A., at a meeting held April 28 resolved to endorse the action of the Boston Chapter in reference to the Stockslager Bill reorganizing the office of the Supervising Architect.

The following correspondence will explain itself.

CINCINNATI, O., February 18, 1885.

TO THE CINCINNATI CHAPTER OF ARCHITECTS: —

Gentlemen, — Knowing that whatever can benefit the building trade is of interest to you, and that your members have to a great extent the direction of that trade, we beg to call your attention to what we consider to be an evil, which with your aid we wish to abolish, viz.: The sub-letting of plumbing work. This system, which has been carried on for years, is in our opinion a prime cause of the great amount of imperfect plumbing which has been and is being done; plumbing which is a discredit to all parties concerned — yourselves included — and which has damaged the health and caused the death of many of our fellow-creatures. Sub-letting is, in our opinion, merely a shifting and weakening of the responsibilities for the work, which responsibilities should rest alone with the plumber and the owner, or his architect. But when one party plans the work, another contracts to have it done, and another to do it, and all without competent and disinterested supervision, the way is open for the continuance of those evils which we wish to abate, and with which you are doubtless fully acquainted. It is our desire that the system which produced such poor results in the past, and which is coextensive with the trade itself, should cease; and we respectfully ask your aid and coöperation to that end by your withholding the plumbing from the specifications to be bid on as a lump, or in such other manner as in your judgment would best bring about the desired result. This matter has not only claimed the attention of the plumbing fraternity in this city, but of the plumbing associations of every city of importance, and the plumbers of London, England; of Chicago, Rochester, Buffalo, Milwaukee, San Francisco and Brooklyn have resolved not to sub-contract in the future.

Hoping the above will meet your approval and receive your hearty coöperation, we are, Respectfully yours,

THE MASTER PLUMBERS' ASSOCIATION OF CINCINNATI AND VICINITY.

CINCINNATI, O., May 2, 1885.

TO THE MASTER PLUMBERS' ASSOCIATION OF CINCINNATI: —

Gentlemen, — Your communication of February 18 was duly received, and laid before our Chapter at its last meeting. As we understand it, you desire that the plumbing shall be bid on by plumbers, separate from all other work, and directly to the owner or his architect, and that the contract shall be directly between the plumber and the owner, without the intervention of a third party, thus placing the responsibility of good plumbing directly upon the plumber, where it belongs.

Taking the above view of the matter, the architects are in full accord with your desires, and have used and will continue to use all proper means to obtain the desired results.

Yours respectfully,
CINCINNATI CHAPTER A. I. A.,
CHARLES CRAPSEY, Sec.

MISTAKES IN PLUMBING.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,—In your issue of April 18, you name thirty-nine "mistakes in plumbing." May I ask you to answer a few queries in reference to some of them. First as to No. 1: Why do you object to putting a trap at foot of soil-pipe? 16. What do you mean by "neglecting to trap leaders?" 17. Why do you object to "connecting branch-wastes with water-closet trap, particularly when separately trapped and vented?" 27. "Using lead for lining tanks for storage for domestic purposes." Do you mean that this is objectionable where it is used for bathing purposes or cooking purposes, or both; and what would you substitute? By answering the above you will greatly oblige, "IGNORANCE."

[ALTHOUGH "Ignorance" has read the article he mentions so carelessly as to attribute the formulation of the thirty-nine "mistakes" to ourselves, instead of to Mr. Murphy, the lecturer before the New York Trade School, we will answer his questions, while disclaiming all responsibility for the enunciations which call them out. 1. We presume that Mr. Murphy belongs to that small class of specialists who believe it well to omit the trap at the foot of the soil-pipe, for the sake of ventilating the sewers 16. The "leaders" which are to be trapped we suppose are rain-water down-spouts connecting directly with the sewer, and yet having their gutter-opening near an attic window. 17. One proper trap, properly ventilated, is sufficient on a branch-waste. To run it into a water-closet trap is a needless double-trapping; it retards the flow and scour of the discharge through the waste, and, usually entering the trap at slight grade, the foul matter in the trap can stand and settle in the waste-pipe, thus greatly increasing its initial foulness. 27. Lead should not be used for water-tanks the water of which is to be used for cooking or drinking, particularly if it is cistern water. The best tanks are of slate, tinned copper, asphalt, or one kind or another of composition lining. —EDS. AMERICAN ARCHITECT.]

COMMISSIONS. — RESPONSIBILITY.

EL PASO, TEX., April 18, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Gentlemen, — You would oblige by giving an answer to the following questions: —

1. A hotel was planned two stories in height above a basement. The plans were all complete, accepted, and work commenced thereon, when the owners decided to add a third story. This necessitated another elevation-plan, and changed the balance of floor-plans more or less. Does the percentage in this case on the whole cover the extra work in changing the plans also? If not, what extra percentage are the changes worth?

2. Is the architect responsible when the hearth of a fireplace is improperly laid, or the contractor? Respectfully, E. K.

[1. IT would be impossible to frame a rule for percentages to cover all cases of extra work on the part of the architect. The best way is to keep a record of the time of every person employed in the office of the architect, dividing it every day according to the number of hours during which each worked upon the different commissions in hand. In this way, by adding up the cost of labor and other items required in the alteration of the plans, the fair price for the work could easily be ascertained, and easily collected, if necessary.

2. The architect is in no way responsible for defective work of any kind on the part of the contractor, unless its defects followed from faithfully carrying out erroneous drawings and specifications made by the architect, or from obeying his injudicious orders. If the architect should neglect to give reasonable attention to the supervision of the work, so that the contractor fell innocently into errors for want of directions, the former might be held responsible for the consequences, in a degree varying according to the extent of his failure to give reasonable and ordinary attention to his business; but for the bad execution of work which he agreed to do well, the contractor, and only the contractor, is responsible. — EDS. AMERICAN ARCHITECT.]

MILFORD, April 28, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — A certain town appoint a committee to obtain plans, specifications and details for remodelling a town-hall, and also actual estimate of the cost of the same from builders. The architect is selected by the committee without any agreement as to his commission. He makes plans, specifications and details and receives tenders; his plans for remodelling are unanimously recommended, the estimated cost of same fourteen thousand dollars. A majority vote in favor of remodelling, but fail to get the two-thirds vote required by law to raise money to pay for the same, and consequently there is nothing further done. Now, what percentage upon the estimated cost would be proper for the architect to charge under such circumstances?

SUBSCRIBER.

[THE customary charge in such cases is three-and-one-half per cent on the estimated cost of the building. — EDS. AMERICAN ARCHITECT.]

THE HEIGHT OF THE WASHINGTON MONUMENT.

NEWPORT, R. I., April 8, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Will you, through the columns of the *American Architect*, give the exact height of the Washington Monument as completed? A discussion here has shown much diversity of opinion on the subject, and the published accounts differ materially. Your correspondent of February 17, Mr. Desmond Fitzgerald, states that the "top of the monument as it now stands is 555 feet above its base, which, exclusive of its concrete foundation, is about 55 feet square." This does not seem to establish clearly this base as the ground-line. Kidder — "*Architect's and Builder's Pocket-Book,*" lately published — gives the height as 542 feet — a difference of 13 feet in altitude. Does the height as given by Mr. Fitzgerald commence from the top of the concrete underpinning? If so, it must be some distance below the finished grade-line.

Thanking you in advance for your attention to the matter, I remain, Very truly yours, GEORGE C. MASON, JR.

[MR. FITZGERALD gives the following measurements as exact: As finished, the structure is 555 feet 5 1-8 inches in height above the ground-line, or top of the foundation. The topmost point is 597 feet 3 inches above mean low water in the Potomac. — EDS. AMERICAN ARCHITECT.]

DEAFENING FELT. — RE-BRONZING ZINC METAL.

MILFORD, April 28, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — If not too much trouble would like answers to the following questions: —

1. What do you consider the best brand of felt for deafening floors?

2. Can you give me directions for re-bronzing a fountain? the fountain is made of zinc. Yours respectfully,

FRED SWASEY.

[1. WE know of no reason for recommending any particular brand of deafening felt. Our personal preference is for the soft cane-fibre felt.

2. The fountain is probably colored by varnishing with any water-proof

varnish, tinted with burnt sienna or asphaltum, or a mixture of both, so as to give the required shade. The projecting portions are perhaps touched with copper or gold bronze. There are many ways of bronzing white metal, but the varnish, although giving a coarse effect, is most likely to be used for such a purpose. Perhaps some maker of iron statuary would be able to give more exact directions. — Eds. American Architect.]

ON LIGHTNING-RODS.

Boston, Mass., May 2, 1885.

To the Editors of the American Architect: —

Dear Sirs, — Your correspondent in last *American Architect* will find the report of the Lightning-Rod Conference (published in 1882, London, E. & F. Spon, — also 446 Broome Street, New York) the most exhaustive work on the subject of lightning-rods. It includes an abstract of Spang's book, as well as many others; also, testimony from all parts of the world. Yours, F.

A DILEMMA.

Ashbourne, Pa., April 27, 1885.

To the Editors of the American Architect: —

Dear Sirs, — Most of, if not all, the plans for stables sent you are liable to grave criticism in this way: If the man sleeps over the stalls his health (and temper) suffer [See Mayhew, *passim*]. If the hay is stored over the stalls it also is poisoned by the ammonium carbonate emanations. Please draw your own conclusions.

Sincerely yours, M. C. Lea.

NOTES AND CLIPPINGS.

Heidelberg Castle. — The commission appointed to examine the foundations of Heidelberg Castle which were reported caving in on account of the railway tunnel beneath them, says it finds the foundation of the Otto Heinrich's wing in perfect condition and the Findrich wing the same, so far as examined. The report was apparently more shaky than the foundations. — *Philadelphia Press.*

Some Boston Buildings. — Will coming generations believe that the Bedford and Washington Street fronts of R. H. White's establishment — the one strong and dignified, the other fussy and weak — were designed by the same person; or that the same owner erected the Ames Building on Harrison Avenue Extension and that on the western corner of Bedford and Kingston Streets; or that the same era produced the last-named building and the one opposite — the first strong, majestic, beautiful, with more of the true principles of architecture in its composition than any other street front in America, a whole volume for the student's study, the other like a bonded warehouse on stilts? Or will it readily be believed that the same architect designed said warehouse on stilts and the Providence City-Hall? Will they believe it possible for the same day and generation to have produced Trinity Church and the new Hollis-Street Church? Or that connoisseurs, interested in and desirous of promoting art, could have selected or approved of such an experiment in terra-cotta as the Museum of Fine Arts, or have adopted such a style of architecture for a museum of fine arts under any consideration whatever? Will they believe that an institution like the Massachusetts Institute of Technology erected buildings of such vast difference in architectural merit as the two on Boylston Street, the one a really good example of architectural work, with one of the finest Corinthian porticos of any age or time; the other out of place, and ill-befitting a great school pretending to foster and to teach the art of Architecture? — *J. L. Faxon in The Spectator.*

Missouri's Buried City. — The amusing fabricator of absurdities who ran such a rig in the West a few years ago seems to have recovered his nerve, to judge by the following, which appears in the New York *Times* of April 8. The city of Moberly, Mo., is stirred up over the discovery of a wonderful buried city, which was discovered at the bottom of a coal shaft, 360 feet deep, which was being sunk near the city. A hard and thick stratum of lava arches in the buried city, the streets of which are regularly laid out and inclosed by walls of stone, which is cut and dressed in a fairly good, although rude, style of masonry. A hall 30 by 100 feet was discovered, wherein were stone benches and tools of all descriptions for mechanical service. Further search disclosed statues and images made of a composition closely resembling bronze, lacking lustre. A stone fountain was found, situated in a wide court or street, and from it a stream of perfectly pure water was flowing, which was found to be strongly impregnated with lime. Lying beside the foundation were portions of the skeleton of a human being. The bones of the leg measured, the femur four and one-half feet, the tibia four feet and three inches, showing that when alive the figure was three times the size of an ordinary man, and possessed of a wonderful muscular power and quickness. The head bones had separated in two places, the sagittal and the coronal sutures having been destroyed. The implements found embrace bronze and flint knives, stone and granite hammers, metallic saws of rude workmanship, but proved metal, and others of similar character; they are not so highly polished, nor so accurately made as those now finished by our best mechanics, but they show skill and an evidence of an advanced civilization that are very wonderful. The searching party spent 12 hours in the depths, and only gave up explorations because of the oil in their lamps being low. No end to the wonders of the discovery was reached. The facts above given are vouched for by Mr. David Coates, the Recorder of the city of Moberly, and Mr. George Keating, City Marshal, who were of the exploring party. A further extended search will be made in a day or two.

York House Water-gate, London. — Attention has lately been called to the neglected state of the York House Water-gate, and, as very few people know where that monument of the skill of Inigo Jones and of architecture in the period of James I is to be found, it is well that we should supply some little account of it. The present writer had some difficulty in finding it, for so neglected is it that in Bacon's Atlas of London its name is entirely omitted. It was found at last at the lower end of Buckingham street, Strand, half buried in a deep hole, or rather trench, between the precipice in which the street terminates and the new gardens on the Thames embankment. From being one of the ornaments of London it has become the abode of every sort of abomination, and Lord Brabazon was undoubtedly right when he demanded a short time ago through the newspapers that the Board of Works or some other public body should take charge of it. What ought to be done with the gate is a more difficult question. It stood originally on the bank of the Thames, and formed the imposing entrance to York House, which, having been in the reigns of Mary and Elizabeth the town inn or residence, first of the Bishop of Norwich, and then of the Archbishop of York, was granted by James I to George Villiers, Duke of Buckingham, who rebuilt it in a magnificent manner. A contemporary drawing by Hollar is among the treasures of the Pepysian library at Cambridge. The great interest attached to the gate is not so much for its architecture as for its situation. Of all the buildings represented in Hollar's drawing, made about the middle of the seventeenth century, nothing remains except this gateway. It then stood proudly on the river's bank, now the river has been driven away by the Thames embankment to a distance of about 130 yards, and the gateway is as completely buried as the Arch of Severus in the Forum of Rome, and indeed we hear that its existence is still further threatened by the proposed railway from Euston to Charing Cross, and it seems likely that it may have to be moved at last. Let us then pursue its history a little farther. The palace of the Duke of Buckingham had but a short life; it was pulled down after the Restoration, and the site laid out in several streets which still retain the position and the names which were then given to them. George court, Villiers street, Duke street, and Buckingham street preserve the name and title of "Steenie" and his son, and so careful were they to commemorate the whole title that the alley which led from Villiers street to George court, parallel to the Strand, was named Of-alley, and retained that name until the end of the last century. Of-alley is now called York place. — *Pall Mall Gazette.*

Effect of Earthquakes on Buildings. — Mr. John Milne, of Tokio, Japan, has published some observations of the effects of earthquakes on buildings. In regard to the relative security of buildings on low and on high ground there is no universal rule, but each small area in an earthquake-region has its peculiarities. Theory indicates that soft, marshy ground is safer, because it will act as a buffer between the shock and the building; and the Temple of Diana, at Ephesus, was located with reference to this point. But experience at Tokio and Manila has shown repeatedly that there is very little, if anything, in it; and hard, rocky strata, where the amplitude of motion is small, but the period quick as compared with the motion in the inelastic material of the plains, proved the better foundation in Jamaica in 1692, and at Lisbon in 1755. Places to be avoided are the edges of cliffs, scarps and cuttings. Europeans fasten the foundations of their buildings firmly in the ground, and their houses are much shaken. The Japanese put their structures loosely on top of stones or boulders, and they escape serious disturbance. Europeans and Americans build iron-bound houses to resist earthquakes, and they resist them, though they get badly shaken, as a steel box would be; but they are very expensive. The Japanese and the people of the west coast of South America build a kind of wicker-basket house — a frame house with a light roof, which lives through the earthquake like "a reed shaken by the wind." The stability of such houses depends upon their not being firmly attached to the earth, and their numerous joints admit considerable yielding, so that the earthquake-wave passes through them before they begin to show its visible effects. A cheap aseismic house would be a low frame building supported by a number of slightly concave surfaces resting on segments of stone or metal spheres in connection with the ground. Chimneys should be given a play-space around them, and not be in contact with the roof; else, since the vibrational periods of the chimney and the roof never correspond, clashes will occur between them, and a shock and overthrow result. The pitch of the roof should not be great, or the tiles or slates will be shot off; and the upper parts of all buildings should be as light as is consistent with strength. — *Popular Science Monthly.*

Evolution of the Elevator. — I do not know, nor does the Encyclopædia afford me any information, when the contrivance called an "elevator" or "lift" was first introduced into public use. I think, however, that it is of very recent origin, except possibly for hoisting freight, etc., when some lifting apparatus has, of course, always been necessary. But the passenger elevator certainly does not go back over half a score of years. It seems rather curious, therefore, to find in the "Greville Memoirs," in the account of a visit to Genoa, made by the author in 1830, the following note: "Called on Mme. Durazzo, and went with her and her niece, Mme. Ferrai, to the King's palace, formerly a Durazzo palace, like the others, a fine house, full of painting and gilding, and with a terrace of black and white marble commanding a view of the sea. The finest picture is a Paul Veronese of a Magdalen with our Saviour. The King and Queen sleep together, and on each side of the royal bed there is an assortment of ivory palms, crucifixes, boxes for holy water and other spiritual guards for their souls. For the convenience of their bodies he has had a machine made like a car, which is drawn up by a chain from the bottom to the top of the house; it holds about six people, who can be at pleasure elevated to any story, and at each landing place there is a contrivance to let them in and out." Certainly this was the precursor of the modern elevator, for it possesses all its essential features — much more so than the passenger car used in the torture-chamber of the Inquisition in the sixteenth century, which took in passengers, hoisted them up, and then had a bad habit of letting them out through the bottom and landing them on sharp spikes without consulting them as to when or where they desired to make a landing. — *Germantown Telegraph.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents herementioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

316,134. METALLIC SHINGLE. — Moses G. Farmer, Newport, R. I.
316,152. ELEVATOR. — Frank S. King, West Brimfield, Mass.
316,172. TILE-TABLE. — George Potts, Indianapolis, Ind.
316,174. SLIDING WINDOW-SCREEN. — John C. Proctor, Wooster, O.
316,175. WOOD FLOORING, CEILING OR DADO. — Alfred Putney, London, Eng.
316,193. SASH-CORD FASTENER. — Henry Smith, Jr., Baltimore, Md.
316,219. FASTENING FOR MEETING - RAILS OF SASHES. — Geo. M. Baker, New Britain, Conn.
316,222. WINDOW - SCREEN HOLDER. — Henry C. Barlow, Dallas, Tex.
316,264. WEATHER-STRIP. — Edwin V. Heaford, Cincinnati, O.
316,265. LATCH. — John W. Helton, Waterloo, Iowa.
316,274. STEAM-HEATING BOILER. — John W. Latimer, Newark, O.
316,278. SOLDERING-TOOL. — James Mactear, Glasgow, Scotland.
316,282. SASH-HOLDER. — Jas. McCormick, Princeton, Ind.
316,283. DOOR-CLOSER. — John McDonald, Middletown, O.
316,284. STEAM-RADIATOR. — Thomas L. McKeen, Easton, Pa.
316,285. FASTENING FOR MEETING - RAILS OF SASHES. — Thos. L. McKeen, Easton, Pa.
316,296. PLANE. — Louis C. Rodier, Detroit, Mich.
316,301. SHINGLE - SAWING MACHINE. — Frank Stahl, Cleveland, O.
316,318. WELL-TUBE FOR DRIVE-WELLS. — Willet C. Wells, Tiffin, O.
316,338. SIDING-GAUGE OR DOG. — Augustus C. L. Davis, Norfolk, Neb.
316,341. BEVEL. — John W. H. Doubler, Rockford, Ill.
316,361. FIRE-PROOF FLOOR. — Wm. B. and Chas. H. Hayden, Columbus, O.
316,375. FIRE-ESCAPE AND WATER-TOWER COMBINED. — Charles A. Lieb, New York, N. Y.
316,376. ELECTRIC BURGLAR-ALARM. — Frank G. Lyon, Jersey City, N. J.
316,397. KILN FOR BURNING BRICKS, TILES, ETC. — Fawcett Plumb, Streator, Ill.
316,413. SUPPORT FOR GUTTERS OF SKYLIGHTS, ROOFS, VAULTS, ETC. — J. Franklin Stuckert, Philadelphia, Pa.
316,415. FIRE-ESCAPE LADDER. — Lorens Swenson, Cresco, Iowa.
316,450. BLOCK PAVEMENT FOR STREETS AND SIDEWALKS AND MOULD FOR CONSTRUCTING THE SAME. — Henry G. Fiske, San Francisco, Cal.
316,452. CUTTING - PLIERS. — Napoleon Gill, Holyoke, Mass.
316,459. ADJUSTABLE BRACKET. — Woodbury S. How, Cincinnati, O.
316,464. PLASTERING TROWEL. — John C. Huther, Rochester, N. Y.
316,487. PAINT-MIXER. — Charles Ross, Jr., Brooklyn, N. Y.
316,493. HOT - AIR STOVE. — Peter H. Sims and Philip Hohmeier, Waterloo, County of Waterloo, Ontario, Can.
316,495. SEAT AND OPERA - CHAIR. — William F. Spencer, Richmond, Ind.
316,517. WINDOW-SCREEN. — William Bateman, San Francisco, Cal.
316,522. STEAM-HEATING RADIATOR. — William W. Carman, Exeter, N. H.
316,529. SHUTTER - WORKER. — Leon O. Dion, Natick, Mass.
316,530. LINE-CHALKER AND PLUMB-BOB. — James L. Downie and Joseph E. Hardin, Allegheny, Pa.
316,538. DRAWING - BOARD. — Seth W. Goodwin, Toledo, O.
316,555. WINDOW - BEAD FASTENER. — Egbert E. Masters and Lavirgne J. Kimball, Sacramento, Cal.
316,567. APPARATUS FOR THE INTERMITTENT DISCHARGE OF SEWAGE, ETC. — George S. Pierson, Kalamazoo, Mich.
316,571. DEVICE FOR CLOSING DOORS. — Nathan H. Richardson, Brooklyn, N. Y.
316,573. SCAFFOLD-BRACKET. — Charles H. Rockwood, Marlborough, Conn.
316,574. DOOR-LOCK. — Robert G. Roland, Beech Grove, Ky.
316,577. SAFETY-BRAKE FOR ELEVATORS. — Friedrich Schnizlein, Munich, Bavaria, Germany.
316,578. EAVES - TROUGH. — Henry H. Schumann and Charles Muth, Troy, Pa.
316,581. FIRE-EXTINGUISHER. — William H. Stratton, New Haven, Conn.
316,582. SASH-BAR. — Herbert A. Streeter, Chicago, Ill.
316,591. KNOB-ATTACHMENT. — Arthur H. Wood, Lansing, Mich.
316,605. HEATING-STOVE. — Americus V. Cook, Dexter City, Mo.
316,620. COMBINED HEATER AND VENTILATOR. — Frank R. Henry, Murfreesborough, Tenn.
316,621. ELECTRIC BURGLAR - ALARM. — John H. Hill, Long Island City, and Joseph E. Babcock, New York, N. Y.
316,627. WINDOW-BLIND SLAT-HOLDER. — William Jensen, Victoria, British Columbia.
316,633. FAN - ATTACHMENT FOR ELEVATORS. — Richard Marshall, Brooklyn, N. Y.
316,643. COMBINED SCAFFOLD AND LADDER. — Fredrick W. Niehaus, McGirk, Mo.
316,705. HINGE AND FRAME FOR VAULT-COVERS. — Michael S. Weller, Charlestown, W. Va.
316,717. NAIL. — John Young, Wheeling, W. Va.
316,757. FIRE-ESCAPE. — George Denison, Princeton Junction, N. J.
316,760. BOLT. — Carl F. Diehlmann, Brooklyn, N. Y.
316,772. HEATING-APPARATUS. — George Gessner, Cumberland, Md.
316,781. CHIMNEY-COWL AND VENTILATOR. — William G. Henis, Philadelphia, Pa.
316,785. HEATING AND SOLDERING IMPLEMENT. — William A. Hoeveler and Charles Keller, Pittsburgh, Pa.
316,822. FASTENING FOR MEETING - RAILS OF SASHES. — Wilhelm Pohlmann, Cleveland, O.
316,853. RAIN - WATER ESCAPE. — Orion De Kay Townsend, Isle St. George, O.
316,861. CHIMNEY - FLASHING. — Titus H. Apple, Meadville, Pa.

SUMMARY OF THE WEEK.

Baltimore.

LIVERY STABLE. — Frank E. Davis, architect, is preparing plans for Collins Stewart, Esq., for a three-st'y brick, with stone and terra-cotta finish livery-stable, 120' x 220', to be built cor. Boundary St. and Mt. Royal Ave.; cost, $45,000.

BUILDING PERMITS. — Since our last report forty-five permits have been granted, the more important of which are the following: —

Leander Foreman, 11 three-st'y brick buildings, w s Division St., commencing s w cor. Wilson St.; and 8 two-st'y brick buildings, s s Wilson St., between Division St. and Pennsylvania Ave.

John Kuper, 26 two-st'y brick buildings, e s Calhoun St., between McHenry and Ramsay Sts.

James A. Gary, four-st'y brick warehouse, n s German St., between Hanover and Sharp Sts.

Thos. S. Hughes, 6 three-st'y and basement brick buildings, e s Stricker St., n of Hollins St.

Sally Luntz, three-st'y brick building, n w cor. Bloom and Ettinge Sts.

W. T. Phillips, 6 three-st'y brick buildings, w s Gilmor St., between Fayette and Baltimore Sts.

Jos. M. Cone, 5 three-st'y brick buildings, s s Franklin St., w of Pearl St.

South Baltimore Per. Mutual Life and Saving Association, three-st'y brick building, e s Light St., between Montgomery and Warren Sts.

Boston.

BUILDING PERMITS. — *Wood.* — *Haywood St.*, near Hazel Pl., dwell., 20' x 42'; owner, Doll. Jameson; builder, H. J. Bartlett.

Dorchester Ave., near Centre Ave., dwell., 20' and 27' x 41'; owner and builder, Ira A. Medbury.

Unnamed St., near Boston St., dwell., 22' and 25' x 29'; owner, S. B. Pierce; builder, W. J. Jobling.

Unnamed St., near Hamlet St., 2 dwells., 22' and 25' x 29', owner and builder, same as last.

Dorchester Ave., No. 317, stable, 30' x 40'; owner, William Peard; builder, W. J. Jobling.

Brooklyn.

BUILDING PERMITS. — *Kingsland Ave.*, w s, 95' n Van Cott Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,000; owners, Christ. and Fred. Gerhard, Kingsland Ave.; architect, Th. Engelhardt; builders, Doyle & Brazil and Sammis & Bedford.

Stagg St., n s, 150' w Waterbury St., 3 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,000; owners and builders, Roeder & Kraemer, Bushwick Ave. and Ten Eyck St.; architect, Th. Engelhardt.

Jefferson St., s s, 490' e Throop Ave., 8 three-st'y brown-stone dwells., gravel roofs; cost, each, $6,000; owner and architect, William Studdiford, 82 Woodbull St.

York St., s e cor. Hudson Ave., 2 four-st'y brick tenements, tin roofs; cost, total, $10,000; owner, architect and builder, Wm. Taylor, 83 Third Pl.

Flushing Ave., n s, 44' w Marcy Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,500; owner and builder, Henry Loeffler, 189a Stockton St.; architect, H. Loeffler, Jr.

India St., s s, 160' e Franklin St., three-st'y frame (brick-filled) tenement, cement roof; cost, $4,500; owner, Alex. De Groot; architect, F. Weber; builders, J. Doig, Jr., and Gately & Smith.

Herkimer St., n s, 306' e Howard Ave., 13 three-st'y brick dwells., gravel roofs; cost, each, $3,000; owner and architect, Benj. T. Robbins, Northport, L. I.; builder, E. K. Robbins.

North Eighth St., No. 110, s s, 150' w Third St., four-st'y brick tenement, tin roof, wooden cornice; cost, $6,500; owner, John Greany, 88 North Fifth St.; architect and contractor, H. Akerly; mason, J. Mead.

Adelphi St., No. 446, w s, two-st'y front, three-st'y rear brick shop, tin roofs, iron cornices; cost, $4,000; owner, James White, 811 Fulton St.; architects, Parfitt Bros.

Vanderbilt Ave., e s, 98' s Fulton St., four-st'y brick store and dwell., gravel roof; cost, $3,500; owner and builder, Joseph I. Kirby, 73 Gates Ave.; architect, A. Hill.

Bedford Ave., e s, 20' n Halsey St., three-st'y brick public hall, slate roof; cost, $30,000; owner, Mrs. Kate Anderson, New York; architect and contractor, W. H. Burhaus; mason, E. J. Otis.

Herkimer St., s s, 25' w Ralph Ave., three-st'y frame tenement (brick-filled); cost, $4,000; owner, John Givens, 177 Stuyvesant Ave.; architect, I. D. Reynolds.

Union St., n s, 109' e Seventh Ave., 5 three-st'y brown-stone dwells., tin roofs; cost, each, $10,000; owner and builder, John Magilligan, 56 Berkeley Pl.

Vanderbilt Ave., *Nos.* 246 *and* 248, w s, 146' n De Kalb Ave., four-st'y brick and sandstone tenement, plastic slate roof; cost, about $30,000; owner, Morris Building Co., Phœnix Building, Court St.; architects, Lamb & Rich; builders, T. Donlon and F. D. Norris.

Bergen St., n s, 250' w Hoyt St., 6 three-st'y brown-stone dwells., gravel roofs; cost, each, $5,000; owner, T. H. Robbins, 178 Garfield Pl.; architect, A. Hill; builder, S. C. Prescott.

Lexington Ave., s s, 100' e Bedford Ave., 14 two-st'y brick dwells., tin roofs; cost, each, $3,500; owner, Mary E. Hall, 63 Patchen Ave.; architect, C. G. Hall.

Brooklyn Ave., w s, 20' s Atlantic Ave., 5 three-st'y brick and brown-stone dwells., fire-proof roofs; cost, each, $3,500; owner, Henry W. Sage, Ithaca, N. Y.; architects, Wm. Field & Son; builders, F. Curran and J. Thing.

Brooklyn Ave., s w cor. Atlantic Ave., 2 four-st'y brick stores and tenements, fire-proof roofs; cost, each, $8,000; owner, architect and builder, same as last.

Twenty-seventh St., n s, 125' e Fourth Ave., 5 three-st'y brick dwells., tin roofs; cost, each, $4,000; owner, Mrs. Matilda Goodwin, 123 Twenty-eighth St.; builder, J. P. M. Goodwin.

Gates Ave., s s, 250' e Stuyvesant Ave., four-st'y brick store and tenement, tin roof; cost, $9,000; owner, John Wiegel, Gates Ave., n e cor. Stuyvesant Ave.; architect, J. T. Perry.

Third Ave., e s, 100' s Seventeenth St., three-st'y frame store and dwell. (brick-filled), tin roof; cost, $4,145; owner, Jacob Harding, Third Ave.; architect, H. Skinner; builder, Jno. Sorensen.

Gates Ave., n w cor. Lewis Ave., 5 three-st'y brick stores and tenements, tin roofs; cost, each, $9,000; owner, L. P. McGarry, 583 Monroe St.; architect, J. McGarry.

Marcy Ave., w s, 25' s Ellery St., 6 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,000; owner and builder, George Straub; architect, Th. Engelhardt.

Stockton St., *No.* 296, n s, 127' e Sumner Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner and builder, John Watson, on premises; architect, Th. Engelhardt.

Lynch St., s w cor. Marcy Ave., three-st'y frame store and dwell., tin roof; cost, $3,800; owner, Mrs. Margaret Mulvihill, 155 Lynch St.; architect, H. Vollweiler; builder, N. Mulvihill.

Marcy Ave., n w cor. Park Ave., three-st'y frame store and tenement (brick-filled), tin roof; cost, $5,000; owner and builder, George Straub, 11 Lewis Ave.; architect, Th. Engelhardt.

Shafer St., s s, 120' w Bushwick Boulevard, two-st'y frame dwell., tin roof; cost, $3,800; owner, Geo. Schwarz, Clarkson Ave., Flatbush; architect, G. Hillenbrand; builder, C. M. Rocker.

Marcy Ave., s w cor. Ellery St., three-st'y frame store and tenement (brick-filled), tin roof; cost, $5,000; owner and builder, George Straub; architect, Th. Engelhardt.

Marcy Ave., w s, 22' s Lynch St., 3 three-st'y frame tenements (brick-filled), tin roof; cost, each, $4,000; owner, Mrs. M. Mulvihill, 155 Lynch St.; architect, H. Vollweiler; builder, N. Mulvihill.

Columbia St., *No.* 128, s e cor. Degraw St., rear, five-st'y brick store and tenement, tin roof; cost, $6,000; owner, T. B. Woolsey, 1380 Broadway, New York; architect, G. E. Harding.

Hancock St., n s, 100' w Nostrand Ave., 3 three-st'y brown-stone dwells., tin roofs; cost, each, $9,000; owner and builder, S. E. C. Russell, 58 Hancock St.; architect, I. D. Reynolds.

Quincy St., s s, 70' e Marcy Ave., 4 two-st'y front and three-st'y rear brick and brown-stone dwells., tin roofs; cost, each, $5,000; owners, Tomkins & McIndoe, 542 Marcy Ave.; architect, E. F. Gaylor; builders, S. J. Burrows and E. Hendrickson.

Franklin Ave., n e cor. Pacific St., three-st'y brick and brown-stone store and dwell., tin roof; cost, $6,000; owner and builder, D. H. Fowler, 777 Bedford Ave.; architect, W. M. Coots.

Pacific St., n s, 55' e Franklin Ave., four-st'y brick tenement, tin roof; cost, $10,000; owner and builder, D. H. Fowler, 777 Bedford Ave.; architect, W. M. Coots.

Wyckoff St., *No.* 92, s s, 175' e Smith St., four-st'y brick tenement, tin roof; cost, $8,000; owners, Jezek & Moller, 147 East Forty-fourth St., New York; architect, F. Jezek.

Twenty-third St., n s, 250' e Third Ave., 2 three-st'y brick tenements, tin roofs; cost, each, $6,000; owners, S. K. & E. H. Frost, 100 Park Pl., New York; architect, W. M. Calder; mason, not selected; contractor, A. G. Calder.

Willoughby St., n s, 50' e Bridge St., two-st'y brick store and dwell., tin roof; cost, $5,000; owner, Dr. Shepard, 174 Willoughby St.; architect and builder, C. P. Skelton.

Sixteenth St., s s, 79' w Third Ave., 2 three-st'y frame tenements, tin roofs; cost, each, $3 250; owner, Henry Schwartje, Third Ave. and Sixteenth St.; builder, John Sorenson; architect, W. H. Wirth.

ALTERATIONS. — *North Tenth St.*, foot of, add one-st'y building; cost, $10,000; owner, Pratt Manufacturing Co., foot North Twelfth St.; architect, T. R. Robbins; builder, not selected.

Bedford Ave., *No.* 191, three-st'y and basement brick extension, tin roof, iron cornice; cost, $10,000; owner, Walter M. Lock, on premises; architect, E. F. Gaylor; builder, J. Schermerhorn.

Clinton Ave., *No.* 401, new bay-window on front, also interior alterations and new window in gable; cost, $5,000; owner, J. J. Williams, 100 John St., New York; architect, M. Lambkin; builders, J. Kent and L. W. Seaman, Jr.

Chicago.

BUILDING PERMITS. — D. Pyott, 2 two-st'y dwells., 689 and 691 West Harrison St.; cost, $7,000.

J. Clark, four-st'y shop, 13 North Jefferson St.; cost, $8,000.

J. J. Kelly, two-st'y dwell., 194 Sheffield St.; cost, $3,000; architect, Anderson; builder, Wakeman.

G. Weissmann, two-st'y store and dwell., 490 Franklin St.; cost, $4,000.

M. Prykauzer, two-st'y flats, 206 Mohawk St.; cost, $4,500.

Fisher & Holling, bakery, Sebor St.; cost, $4,500.

Nolan & Callahan, three-st'y store and flats, 129 to 135 Wells St.; cost, $22,000; architect, J. Speyer; builder, T. Keating.

H. Stern; two-st'y dwell., 2915 Prairie Ave.; cost, $12,000.

F. Truka, two-st'y store and dwell., 604 Jefferson St.; cost, $3,300.

J. Nerad, three-st'y store and dwell., 154 Bunker St.; cost, $5,000.

Church of the Covenant, one-st'y church, 1023 North Halsted St.; cost, $9,000.

J. L. & C. N. Griffith, 2 three-st'y dwells., 180 and 182 Sebor St.; cost, $8,000.

J. Lichtenthal, three-st'y dwell., 140 Larrabee St.; cost, $4,000.

J. P. Doerr, three-st'y store and dwell., 2808 Wentworth Ave.; cost, $4,000.

H. C. Kriete, two-st'y dwell., 73 Lincoln Ave.; cost, $6,500; architects, Schaub & Berlin.

J. Schaen, three-st'y dwell., 555 Hulbert St.; cost, $7,500; architects, Furst & Rudolph.

J. Hannon, two-st'y flats, 3753-3757 Forest Ave.; cost, $9,500; architects, Thomas & Rogers.

Mrs. H. G. Stockton, 3 three-st'y dwells., 11-19 Belleview Pl.; cost, $12,000.

M. Hogan, two-st'y dwell., 260 Fourteenth St.; cost, $2,500.

L. Koehn, three-st'y store and dwell., 147 North Ave.; cost, $8,500.

William H. Harper, manager, elevator-building, Haines St. and North Branch; cost, $180,000.

B. Klein, three-st'y flats, 2621 Portland St.; cost, $3,000.

N. W. Horse Nail Co., office, 232 South Clinton St.; cost, $2,500.

C. Holman, two-st'y dwell., 998 West Congress St.; cost, $3,000.

F. Frantzen, three-st'y dwell., 113 West Ohio St.; cost, $5,500.

M. C. Stearns, two-st'y dwell., Twenty-seventh and Lime Sts.; cost, $5,400.

M. C. Stearns, three-st'y dwell., 27 Douglas Ave.; cost, $8,000; architects, Adler & Sullivan.

Trinity Methodist Mission Church, three-st'y church, 2336-2340 Wentworth Ave.; cost, $24,000; architect, W. A. Furber.

J. G. Shortall, two-st'y dwell., 1600 Prairie Ave.; cost, $10,000; architect, C. A. Alexander.

J. W. Garvey, three-st'y store and dwell., 226 and 228 West Eighteenth St.; cost, $6,000.

H. Iverson, three-st'y dwell., 178 West Huron St.; cost, $4,000.

J. Panos, three-st'y dwell., 15 Johnson St.; cost, $4,500.

J. Hickey, two-st'y store and dwell., Erie and Wood Sts.; cost, $4,000.

Mrs. McLaughlin, three-st'y dwell., 309 Loomis St.; cost, $3,700.

M. A. Devine, 2 three-st'y stores and dwells., 68 and 70 North State St.; cost, $13,000; architect, J. J. Egan.

J. Rodant, two-st'y dwell., 3140 Laurel St.; cost, $3,000.

R. Excell, two-st'y dwell., 19 Bryant Ave.; cost, $10,000; architect and builder, R. Excell.

Geo. Healy, two-st'y dwell., 55 Cedar St.; cost, $9,000.

T. Sheldon, two-st'y dwell., 33 Belleview Pl.; cost, $6,000.

P. Nelson, three-st'y store and flats, 22 Milton Ave.; cost, $4,000.

Western Ave. Baptist Church, addition; cost, $6,000.

H. Hoepe, 3 cottages, 105-111 Lubeck St.; cost, $2,700.

W. Balcom, additional story, 2027 Michigan Ave.; cost, $5,000.

H. McNulty, three-st'y store and dwell., 3256 Lasalle St.; cost, $6,500; architect, W. L. Carroll.

O. Oleson, three-st'y flats, 593 West North Ave.; cost, $2,500.

J. J. Healey, 2 three-st'y dwells., 19 and 21 Lane Pl.; cost, $10,000; architect, J. J. Clifford; builder, S. Hayes.

J. H. Dahmke, three-st'y store and dwell., 980 Lake St.; cost, $4,500.

COMPETITION.

STATE-HOUSE.
[At Denver, Col.]

STATE OF COLORADO,
OFFICE OF THE BOARD OF CAPITOL MANAGERS,
DENVER, April 16, 1885.

In pursuance of an Act of the Fifth General Assembly of the State of Colorado, entitled "An Act to provide for the erection of a State Capitol Building at the City of Denver, and creating a Board of Management and Supervision, and appropriating funds therefor," plans and specifications for a Capitol building which, when erected, shall not cost to exceed one million of dollars, will be received by the Board of Managers **until 12 o'clock meridian, on the tenth day of July, 1885.**

The said Capitol building will be erected upon the summit of a plat of ground in the city of Denver, State of Colorado, known as Capitol Hill, with its principal façade to the west. The length of said building to be about 300', and no plans will be considered for a building that are over 310' in length. The breadth, height and general form must be in such proportion to its length as to constitute a symmetrical building, and must be constructed with special regard to strength and durability. The facing and ornamentation of the superstructure, including cornices, pediments and ballustrades, will be of stone.

Drawings must consist of foundation, sub-basement, basement, or first, second or third story plans, roof plans, and section of same, longitudinal section, trans-

COMPETITION,

verse section, front, rear and end elevations, dome plan, giving section of same and material used, and method of construction from base to summit. Also giving diameter or area of base, style of architecture and extreme elevation.

The said Capitol building shall be built of stone, brick and iron, as far as practicable, and of material found in the State of Colorado, provided the same can be found in said State as cheaply as other materials of like quality in other localities. The entire building must be made as nearly as possible fireproof. The laws of acoustics must be carefully observed. The materials used in said building must be of the best quality. Provision must be made for steam-heating apparatus, and for the drainage, lighting and ventilation of said building in the most approved manner; and such a number of fireproof vaults as may be necessary for the preservation of the books and papers of the various departments of the State Government; also for elevators, water closets, etc.

All plans and scale drawings must be put on wooden frames or stretchers in order that they may be convenient for examination, and on a scale of one-eighth of an inch to one foot.

Compensation for plans and specifications will be as follows: For the best set of plans and specifications the sum of $1,500; for the second, $1,000; for the third, the sum of $800. All plans and specifications for which money is paid shall become the property of the State. The architect whose plans are adopted will be required to furnish the same in duplicate. For the detailed working plans and supervision, the amount shall not exceed two and one-half per cent of the cost of said building. No plan will be adopted until it shall be definitely ascertained that the entire cost of said Capitol building shall not exceed the sum of $1,000,000.

Said building must contain the following rooms, and such other rooms as convenience and symmetry require:

The sub-basement shall be eight feet between joists, and adapted to the use of the machinery, etc., of the building.

The basement story to be not less than fourteen feet between joists, and extend twelve feet above the surface of the surrounding ground. Said basement story to be divided into rooms to be used for the Adjutant-General's quarters, Historical Society, Horticultural Society, State Geologist and Mineral Cabinet, Commissioner and Inspector of Mines, and Storage Rooms.

First, or principal office story, to be not less than twenty feet between joists, and to contain, as near as practicable, the following rooms, to wit:

Three rooms for the Governor.
Same for Secretary of State.
Three rooms for Auditor of State.
Same for State Treasurer.

Two rooms for Insurance Department, two rooms for Attorney-General, three rooms for State Engineer, three rooms for Railroad Commissioner.

Four rooms for State Board of Land Commissioners, three rooms for Superintendent of Public Instruction.

Second, or double story, to be not less than forty-two feet between joists. The Senate Chamber, Hall of House of Representatives, Supreme Court Room and State Library to be of full height, other rooms to be approximately half of said height.

One Senate Chamber, with lobbies and galleries of appropriate dimensions, to accomodate fifty Senators; one room for Lieutenant-Governor and President, one room for Secretary of Senate, one Post-office, one Stationery and Bill room, one Sergeant-at-Arms room, cloak room, lavatory and closets; two rooms for Engrossing Committee, two rooms for Enrolling Committee, and not less than ten other appropriate committee rooms for use of Senate.

One hall for House of Representatives, with lobbies and galleries of appropriate dimensions, to accomodate one hundred members; one room for Speaker of the House, one room for Chief Clerk of House, one Post-office, one Stationery and Bill room, one Sergeant-at-Arms room, cloak room, lavatory and closets, two rooms for Engrossing Committee, two rooms for Enrolling Committee, and not less than ten other appropriate committee rooms for the use of House of Representatives.

One State library room, one Librarian's room, and ten committee rooms.

One Supreme Court room, one law library room, one Clerk of Court room, one Marshal of Court room, one consultation room, six judges' private rooms, with fireproof vaults, lavatory and closets attatched.

Public lavatory and closets on each floor of said building.

The drawings must be sent to the "Board of Capitol Managers," Denver, Colorado, and be endorsed "Plans for State Capitol Building," and must come under a *nom de plume*, the real name and address to be sent to the Board of Managers in a sealed envelope, marked "private," which will not be opened until after the award is made.

The Board reserves the right to reject any and all plans.

For further information apply to
BOARD OF CAPITOL MANAGERS.
GEO. T. CLARK,
Secretary. P. O. Box, 2291.
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PROPOSALS.

IRON-WORK.
[At Syracuse, N. Y.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., April 30, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 21st day of May, 1885,** for furnishing and setting in place the iron columns of first story, and all the iron beams, girders, channels, angles, etc., for the second, third, fourth and attic story floors of the post-office, court-house, etc., building at Syracuse, N. Y., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office or the office of the Superintendent.

Bids must be accompanied by a certified check for

PROPOSALS.

$500, drawn to the order of "The Secretary of the Treasury," as a guaranty that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered. M. E. BELL,
490 Supervising Architect.

HEATING AND PLUMBING.
[At Traverse City, Mich.]

TRAVERSE CITY, MICH., April 28, 1885.

Sealed proposals will be received at Traverse City, Mich., by the Board of Commissioners of the Northern Asylum for the Insane, **until 10 A. M., of Thursday, June 4, 1885,** at which time said proposals will be opened, for all labor and materials required for the heating and plumbing, either or both, of the Northern Asylum for the Insane, at Traverse City, Mich., including radiators, steam distribution, hot and cold water distribution, hot-water boilers, tanks, pumps, bath-room, lavatory and closet, fixtures, etc., in accordance with plans and specifications adopted by said Board.

Said plans and specifications can be examined at the office of the superintent, at the Northern Asylum, on and after May 11, 1885.

For further information relative to the plans or conditions, address, C. M. WELLS,
Superintendent.
By order of the Board of Commissioners. 492

LATHING AND PLASTERING.
[At Frankfort, Ky.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., April 24, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 22d day of May, 1885,** for all lathing and plastering required in the court-house, post-office, etc., building at Frankfort, Ky., in accordance with drawings and specification, copies of which and any additional information may be obtained on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check for $300.00, drawn to the order of the Secretary of the Treasury, as a guarantee that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of contract.

Bids received after the time of opening will not be considered. M. E. BELL.
489 Supervising Architect.

IRON-WORK.
[At Hannibal, Mo.]

OFFICE OF SUPERVISING ARCHITECT.
TREASURY DEPARTMENT,
WASHINGTON, D. C., April 30, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 21st day of May, 1885,** for furnishing and fixing in place, complete, the iron columns for first story, and all iron beams, girders, channels, etc., for the second and third story floors of the post-office, etc., building at Hannibal, Mo., in accordance with drawings and specifications, copies of which and any additional information may be obtained at this office or the office of the superintendent of the building.

Bids must be accompanied by a certified check for $300, drawn to the order of the Secretary of the Treasury, as a guarantee that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered. M. E. BELL,
490 Supervising Architect.

SLATING.
[At Toledo, O.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., May 1, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 29th day of May, 1885,** for furnishing and laying all the slate required for the roof of the custom-house, etc., building at Toledo, O., in accordance with drawings and specification, copies of which and any additional information may be obtained on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check for $200, drawn to the order of the Secretary of the Treasury, as a guarantee that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered. M. E. BELL,
490 Supervising Architect.

GRAVING DOCK.
[At Esquimault, B. C.]

DEPARTMENT OF PUBLIC WORKS,
OTTAWA, March 20, 1885.

Sealed tenders addressed to the undersigned, and endorsed "Tender for Caisson, Graving Dock, B. C," will be received at this office, **until Monday, the 1st day of June, 1885,** inclusively, for the construction, erection and placing in position of a caisson for the graving dock at Esquimault, B. C., according to plans and specifications to be seen at the Department of Public Works, Ottawa, and on application to the Hon. J. W. Trutch, Victoria, B. C.

Persons tendering are notified that tenders will not be considered unless made on the printed forms supplied, the blanks properly filled in, and signed with their actual signatures.

Each tender must be accompanied by an *accepted* bank check for the sum of $2,000, made payable to the order of the Honorable the Minister of Public Works, which will be forfeited if the party decline to enter into a contract when called on to do so, or if he fail to complete the work contracted for. If the tender be not accepted, the check will be returned.

The Department will not be bound to accept the lowest or any tender.

By order, A. GOBEIL, Secretary.
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(*Continued on page* xii.)

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVII. Copyright, 1885, JAMES R. OSGOOD & CO., Boston, Mass. No. 490.

MAY 16, 1885.

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CONTENTS.

IT is pleasant to observe the confidence which the best architects and contractors of Cincinnati seem to have in each other, and the comprehension which they appear to have gained of the advantages to each, as well as to the public, which will follow from mutual support in efforts for improving the art and business of building. A few days ago the master plumbers called upon the Cincinnati Chapter of the American Institute of Architects for their approval and moral aid in securing the abolition of the system of sub-letting plumbing contracts, a system which has brought death and grief into thousands of households, and should be discountenanced by all who claim any authority in sanitary matters. The architects responded cordially, promising to exert their influence to promote direct dealings between owners and responsible plumbers; and with their help a much-needed reform is likely to be accomplished. Not long afterward the architects met again with the master-builders to consult over the propriety of advocating the appointment of an expert inspector of unsafe buildings, a measure upon which, as recent events have shown, the safety of the innocent public very greatly depends. The discussion showed very clearly, what those who live under strict building laws already know, that every rational and thoroughly enforced provision in restriction of the liberty of unscrupulous contractors and owners to erect insecure, rotten or poisonous imitations of decent structures, to be palmed off on unsuspecting buyers, is a great and direct benefit to honest builders and conscientious architects, whom the competition of reckless pretenders, in the absence of such regulations, deprives of many opportunities for showing their faithfulness and skill.

NOTWITHSTANDING the small number of professional architects in this country, and the uncertain standing which the profession has as yet acquired in many districts, the influence in the community exerted by the general body of architects is surprising. Almost from the first years of their existence, the associations, local and national, of American architects have busied themselves with reforms in the methods of building which they have found in use; and it should be a matter of pride with all of us that, far from opposing the regulation of construction by statute, they have always been foremost in proposing and amending the building laws now in existence in many States. If their numbers and influence were sufficient to secure the rigid enforcement of the laws which they do so much to have enacted, the debt of the American public to them would be increased, but this is as yet a task far beyond their strength. The last city for which, so far as we know, a building law has been proposed is Newport, R. I., a quiet but prosperous town, to which the gradual interposition of new wooden buildings between and among the wooden houses of the last century has given a combustible character which may well excite the apprehension of those whose knowledge of construction is sufficient to teach them caution. The discussion of the matter, as carried on in the local newspapers, has already become interesting, although it is as yet little more than begun, and some admirable suggestions have been made, one of the best of these, for which the credit is to be given to an architect of the city, being that, instead of waiting for a measure to be evolved by infinite compromises from the heterogeneous mass of prejudices, whims, suspicion and self-interest, combined with a little real science and public spirit, which has hitherto usually given birth to building laws, a commission should be appointed, composed of an architect, a master-builder, a lawyer, a business man, and the city engineer, which should be directed to prepare an ordinance for adoption or amendment. Such a commission could work far more intelligently and effectively than a self-appointed "citizens' committee," and, as the author of the suggestion points out, it would be able to adapt the measure which it decided to recommend to the circumstances of the town for which it acted, instead of merely revising and altering the building laws of other cities, as an irregular body is naturally disposed to do. We trust that if the Newport people are wise enough to follow up their idea of regulating their buildings by law, they will adopt this suggestion of Mr. Mason's. If they do, they will in all probability secure an ordinance of peculiar merit. There are scores of important points in construction which no existing statutes touch, and the field for original work in devising new regulations adapted to such cities as Newport is a wide and inviting one.

A STRIKING instance of the diffusion of typhoid fever by means of running water is reported from Plymouth, Pennsylvania. For some time a violent epidemic of the fever has prevailed in that town, attacking so many of the inhabitants that those who retained their health were hardly sufficient in number to nurse and feed the sick, and help has been asked from the large cities in aid of the stricken village. So virulent and extensive an epidemic has excited the curiosity of scientific men, and a commission of physicians recently made an examination of the water-supply of the town. This is obtained principally from a clear mountain stream which flows through it, but in tracing this stream to its source the commission found, near the springs from which it flows, a house in which typhoid fever had prevailed for several months. The discharges from the patients were thrown into a privy forty feet from the brook, but seem to have found their way over the surface, helped by the wash of the spring rains, into the current, by which they were carried down to poison more than a thousand people, eighty-five of whom have already died, while many others will probably die later. We hope that this will serve as a warning against the similar, but greater dangers, which threaten towns and cities supplied with water exposed to pollution, in case of the importation of cholera into the country this summer. Subtle as is the contagium of typhoid fever, that of cholera appears to be still more so, and the infection which has destroyed eighty-five lives in Plymouth, out of a thousand persons attacked, would probably, if it had been composed of cholera-germs instead of those of typhoid fever, have left the village almost without inhabitants.

THE Bureau of Education at Washington has just issued a circular, in the form of a pamphlet, giving an admirable description and comparison of the methods and means of instructing children in city schools, and containing, as an incident, a description of the more remarkable city school-houses of the country, which, though shorter than we could wish, contains many suggestions of value to architects. To say frankly what the author of the report, Mr. John D. Philbrick, has apparently not understood, the way in which designs for school buildings are usually procured, particularly in the smaller cities, is not calculated to secure the highest degree of professional care, to say nothing of skill, and it must be confessed that the average American city school-house sadly belies the science of American architects. To take a single example, which Mr. Philbrick quotes, a costly building in Philadelphia, erected nine or ten years ago, contains four school-rooms on each floor, arranged in the form of a Greek cross. Three of these rooms on each story are lighted only from a large bay-window in the outer end, in which the teacher's platform is placed, so that all the scholars sit facing the only light in the room. The fourth room on each floor has two windows, of moderate size, instead of the bay, the platform being placed in

front of one of them. It is incredible, as we do not hesitate to say, that any architect of respectable reputation could have designed a school-house on such a plan as this, and we trust that those who read Mr. Philbrick's account of it will lay up for future use the moral that the best, and therefore the cheapest professional advice must be sought by methods very different from those which now prevail among the managers of municipal affairs.

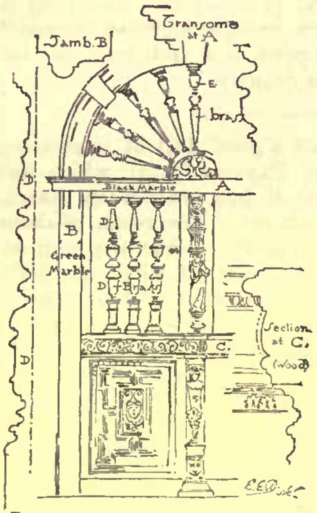
ANOTHER school-house, at Buffalo, seems from the report to be even more ingeniously ill-planned than the Philadelphia example. In this building, which is of recent construction, the class-rooms on each floor are also arranged in the form of a cross, but instead of four rooms, the cross includes five, the fifth being situated at the intersection of the arms of the cross, and receiving nothing but borrowed light through the glazed partitions which separate it from the other four. As most architects of experience in school-house building know, the best structures for the purpose are now generally to be found in the Western cities, but Mr. Philbrick makes an exception in favor of the great English High and Latin School building in Boston, which stands almost alone in this country as an example of a system of planning which is very generally followed abroad, particularly in the modern French schools. In this building, plans and elevations of which were published in No. 172 of this journal, two large interior courts are surrounded by a corridor, from which the class-rooms open. Although by no means an economical arrangement, this secures the best possible light and cross-ventilation for the rooms, and the building is perhaps the most interesting one, in its way, which the country affords.

THE *Art Amateur* gives an interesting account of the sale in New York of the great Seney collection of pictures, which cost about half a million dollars, and were sold for about four hundred and seven thousand. A little excitement was caused, a day or two before the sale, by the positive assertion of a well-known newspaper critic that some of the pictures were forgeries, his opinion being founded on the internal evidence afforded by the pictures themselves. Naturally enough, the managers of the sale, together with the dealers who had sold the specified pictures to Mr. Seney, united in an indignant denial of the imputation cast upon them, and the former immediately instituted a suit for libel against the proprietors of the journal which published the criticism, all of which served admirably to advertise the sale, which was crowded with buyers. It ought to be said that the charge of want of genuineness brought against the pictures, which certainly ought to have had, coming, as it did, just before the sale, a better foundation than internal evidence, was completely refuted, but it served, as such assertions always will among people who depend on others for their opinions, to affect quite seriously the bidding for the particular ones in question. The other pictures, considering the dull times, sold for good prices, several of them for much more than Mr. Seney gave for them, and it is satisfactory to find that as a rule the worst losses were on pictures bought for the name, and presenting inferior specimens of the work of painters in high repute, while the greatest profit was often made on pictures by less-known men, which were bought for their intrinsic beauty, and, like all really beautiful things, gained in value at every change of ownership. The history of one of the pictures, in particular, illustrates very happily the advantage of exercising a well-trained individual taste in selecting such objects. This was one by Renouf, which was bought a few years ago at the Paris *Salon* by Mr. Schaus for sixteen hundred dollars. Although by an artist of no great fashion on this side of the water, Mr. Schaus was so impressed with its merit that he set upon it, when it arrived in New York, the price of twelve thousand dollars, and at this price it was sold to Mr. Seney. The latter, after he had bought it, hearing of the difference between the original cost and what he had paid, went to Mr. Schaus for an explanation of what seemed to him an exorbitant advance, but was met with the cool response that he might have his money back again and return the picture, the price of which would then be raised. Impressed, undoubtedly, with the confidence which Mr. Schaus showed in the value of the picture, as well as by its real merit, which he was probably quite able to appreciate, Mr. Seney concluded to stand by his bargain and keep his picture. When the sale came, the Renouf was put up with the others, and Mr. Schaus himself, who had once bought it for sixteen hundred dollars, now bid seventy-five hundred for it, to sell again, but was outbid by the agent of the Corcoran Gallery in Washington, who secured it for that interesting collection. The best picture in the sale was probably the "Evening in Finistère," by Jules Bréton, which brought eighteen thousand two hundred dollars, the largest price, it is said, ever paid for a picture at an auction sale in this country.

THE New York papers contain a good deal of interesting intelligence in regard to the Panama Canal, which has recently been made the object of two independent examinations by United States Naval officers. The result of these examinations has been given to the public, in the shape of reports to the Navy Department, abstracts of which are published in the New York *Times*. The earliest of these reports was made by Lieutenant Winslow, who was sent from Aspinwall for a week's study of the canal. The time allowed him was far too short for anything like a thorough examination, but he seems to have been very judicious and industrious in collecting information from all possible sources. According to his report, about one-seventh of the excavation for the canal has been completed, in addition to the vast preliminary works, which are even now but just ready for service. Considering the short time which has elapsed since the excavating parties really began work on the various sections, this seems to us an encouraging exhibit, although, as Lieutenant Winslow says, the prospect of the opening of the canal in 1888 appears rather faint. The other report, prepared by Lieutenant McLean, who spent about the same time as Lieutenant Winslow in his inquiries, substantially confirms the statements of the first, but adds some particulars concerning the methods of carrying on the excavation, which is divided into eleven sections, each under the charge of a different contractor. The most difficult portion of the whole is the Culebra section, where the cut to be made is eight hundred and twenty feet wide at the top, but so energetically has the work been carried on that about one-sixth of the material has already been taken out. As it is little more than a year since the trees and underbrush of the primeval forest were cleared away from this part of the line, it seems safe to infer from this evidence that M. de Lesseps and his friends intend to do something more than make a little show of shovelling to cover their appropriation of the Canal Company's funds, as some people were once uncharitable enough to accuse them of wishing to do. We are rather surprised to find no mention in either of the reports of the locks which were at one time said to have been planned in the canal; and the original project of a sea-level canal, if it was ever dropped, seems to have been revived. In regard to the works for the accommodation and health of the canal employés, Lieutenant McLean speaks in the highest terms. No reproach has been more frequently cast upon the canal engineers than that of extravagance and dilatoriness in building docks, artificial harbors, hospitals and barracks, before beginning the work of piercing the Isthmus; but the advantage of possessing them is fast becoming manifest as the number of men employed increases, and it is likely that in this, as well as in other matters, the history of the completed work will show the economy which generally follows from carrying out a well-considered plan.

THE singular contract between the State of Texas and a syndicate of Chicago capitalists, under which the latter were to build the State Capitol, receiving their pay in public lands, is said to be on the point of termination, through the unwillingness of the syndicate to proceed further with the work. The explanation of the trouble, if there is really any trouble, is probably to be sought in the general business depression, which has checked the sale to settlers of the land acquired by the syndicate. The terms upon which the grant was made were regarded at the time as very favorable, and if immigration into Texas had continued at the rate which was expected, the members of the syndicate would probably have already grown rich by their bargain; but there is no heavier load for such an association to carry than a tract of vacant land which no one wants to buy, and it is quite conceivable that the abandonment of the contract, even with the forfeiture of the quarter of a million dollars specified in it as the penalty for non-fulfilment, may seem more prudent than persistence in the work under present circumstances.

REPORT OF A COMMITTEE OF THE AMERICAN INSTITUTE OF ARCHITECTS ON ARCHITECTURAL JOURNALS.



Entrance to Chapel. Ch. of S. Gilles : Bruges :- Belgium. date 1645.

THE Committee to whom was referred the Memorial of the Rhode Island Chapter, in regard to the general usefulness and acceptance to the profession of certain contemporary architectural journals published in the United States, respectfully report: —

That they congratulate the Institute and the profession on the number of excellent serials that are now issued in this country in the interest of architecture and its kindred arts. Considering the limited patronage which necessarily can be obtained for such class-publications, it is not a little remarkable that so many of them are able to sustain themselves under the circumstances; and this no doubt they would fail to do, were it not that their circulation among a class who naturally influence contracts for building materials make them a valuable advertising medium, and thus supplement the limited income derived from subscriptions.

Among these publications they would instance a few which seem to be particularly worthy of mention. In New York is published *Building*, an enterprising monthly, whose special edition usually contains a large number of full-page reproductions of the latest illustrations of the English and other foreign architectural journals, and whose regular edition is well supplied with original articles of more or less marked value, and with not a few illustrations of new buildings of considerable merit. Also, at New York is published *Carpentry and Building*, a monthly, edited with considerable care, full of practical information in regard to the details of building, and not wanting in carefully prepared wood-cut illustrations.

The *Builder and Wood-Worker* is the title of a journal published in New York, monthly, at a very reasonable price. It is filled with illustrations and articles of much value to its readers.

Among New York journals of great interest to architects, and whose labors are devoted to some specialty intimately connected with building, are several of high character and acknowledged usefulness. The *Decorator and Furnisher*, the *Sanitary Engineer*, the *Plumbers' Trade Journal*, the *Hydraulic and Sanitary Plumber*, etc., may be instanced as good journals of their class; and the *Scientific American Supplement*, *Van Nostrand's Magazine*, *Science*, *Engineering News* and others frequently have articles of great interest to the profession.

The *Decorator and Furnisher*, monthly, is elaborately illustrated with drawings exceedingly well executed, and is devoted to the elucidation of the decorative department of architecture. The *Sanitary Engineer* makes a specialty of plumbing and ventilation, and is very ably conducted. The *Plumbers' Trade Journal* and the *Hydraulic and Sanitary Plumber* are conducted more in the interest of the plumbing trade than of sanitary science, but frequently contain articles of much value to all persons interested in that department of building.

The other New York Journals above-named will well repay a careful examination, furnishing, as they do from time to time, essays upon fundamental principles of design that necessarily apply to the arrangement of the several parts of buildings, and to the stability of their construction. The same remark will apply also to the *Journal of the Franklin Institute*, published at Philadelphia, Pa.

At Cincinnati there is a monthly periodical, called the *Cincinnati Building Review*, which is more particularly devoted to the interests of builders, and partakes largely of the nature of a builders' trade journal. It publishes, however, very well-executed cuts of local buildings, and gives an extensive notice of the several building enterprises of the West.

At Chicago is issued the *Inland Architect and Builder*, a publication of very high character, well illustrated, ably edited, and the organ of the Western Association of Architects. Its full-page illustrations are published upon separate sheets, and are generally artistically drawn and printed; they consist of perspectives and plans of local buildings, of which there are many very fine examples, and of various proposed and completed structures in the very extended area of the great West. The noted prominence of Chicago as a commercial centre has made it one of the wealthiest cities of the western States, and naturally the result has been an unexampled activity in building enterprises of all kinds, but more especially in those relating to business requirements. Immense office-buildings, exchanges, club-houses, railroad stations, grain storage buildings, etc., have been erected and are now in process of erection, and afford valuable opportunities for the exercise of the local architectural skill. By these the resident architects have not failed to profit, and altogether a very prosperous condition of affairs has resulted for most of the local offices. This enlarged activity has created a demand for a home medium for the discussion of contemporary designs, and the advertisement of the most improved devices in house-building appliances and in the various materials of construction. This demand has been fully met by the journal above referred to, which now lacks little of satisfactory acceptance, except perhaps in regard to the frequency of its appearance, it being a monthly and not a weekly.

There are several other journals published in Chicago in the interest of house-building. The *Sanitary News*, semi-monthly, is well conducted, and is devoted to all matters having relation to the plumbing and ventilation of buildings. The *Building Budget* is a new serial, partaking of the character of a trades-journal somewhat, but issuing full-page illustrations on separate sheets, and giving descriptions of noted buildings, with architectural criticisms thereon. In its "Precursory Number" for February last, it gives an excellent reproduction of a photograph of the Spanish Steps at Rome, and several wood-engravings. This journal is issued from the office of the Permanent Exhibit of Building Materials, etc., in Chicago, an institution of evident usefulness to all parties concerned, and one that will bear repetition in all the large cities of the Union.

In San Francisco, Cal., the *California Architect and Building News* is a monthly publication, conducted with great energy and ability, and now issuing its fifth volume. Its illustrations of California buildings are liberally given, and it adds a series of portraits of the leading architects of the Pacific coast. It reports the proceedings of the San Francisco Chapter of the American Institute of Architects quite fully, and gives biographies of its prominent members.

At Holyoke, Mass., is published *The Builder*. This is a monthly, conducted with much taste and discrimination, and illustrated with very acceptable wood-cut engravings of new residences, etc. Its editor is the author of those two successful books on country houses, not long since published: "*Homes, and How to make Them*," and "*Illustrated Homes*," and several others.

At Boston, Mass., is issued the *American Architect and Building News*, a weekly of the first class, and, it must be acknowledged, the only journal in this country that can compare favorably with the great London architectural publications. It is very liberally illustrated with full-page lithographic impressions of the latest designs of our most noted architects, and with occasional views of celebrated European buildings. Once a month a fine gelatine print is issued in a special edition. Its editorial department is conducted in a scholarly, courteous, and, at the same time, independent tone, and its selections made with excellent judgment. It is the accepted exemplar of American architectural practice, and is found in the office of almost every architect in the Union.

It is to be expected that a journal addressing itself to the attention of so large a list of patrons would meet with more or less criticism as to its methods, and be subject to the petitions of various classes of its readers for the greater predominance of subject-matter illustrating those departments of architecture in which they take the most interest. It is said that in its pages the technical part of the ordinary practice of an architect is too much neglected; that a larger space given to details of construction, and a more extended discussion of these very important elements of practice would be desirable. It has issued large sheets of details in former numbers, which were very acceptable to its patrons, but lately this practice has been more or less abandoned. But in connection with this complaint it should be borne in mind that all its original designs are the work of contributing architects, and the selections are made from drawings thus sent in by them. Should no sheets of details be offered, none will appear; should an abundance of such drawings be contributed, a proper proportion of them would make a part of each number's illustrations. So if there now exist any grounds for these animadversions, the patrons of the journal have the remedy in their own hands.

It is added, however, that a great many drawings of an interesting description, illustrating important buildings in a practical way, and offered by prominent architects, are constantly being rejected by the publishers, in the interest of the desired esthetical position of the journal, in contradistinction to its more practical character. This course can only be excused under the understood assumption that its practical patrons are to look to other journals of acknowledged technical tendencies for the kind of information they prefer. In this view of its position its course appears more clear and consistent, and those of its readers who can also patronize the more technical journals will thus find a way out of their difficulties. Be this as it may, one thing is certain, that the class of illustrations which are now being published includes drawings which are very highly prized by architects generally, and are certainly of a high character.

In journals of the class under consideration much influence is exerted by the opinions they advance and the statements they make, and it is very important that all representations should be precisely in accordance with the true nature of the facts. Complaint has been heard that in some respects a not sufficiently clear discrimination has been made in the credit given to architects of noted buildings, as to the relative share of merit due to them in their construction; and also that an exercise of more comprehensive views in discussing many questions of vital interest to the profession would be very desirable. The number of instances, however, where a seeming fault of this kind has been pointed out is not large, and even in these cases there is room to believe that they may have been caused by an excessive zeal for the triumph of good ends.

In concluding this report upon the architectural serials of the

country it may not be amiss to remark that every architect should feel is to be his duty to contribute promptly and steadily, by literary work, drawings and subscriptions, to their continued maintenance.

O. P. Hatfield, Henry M. Congdon, } *Committee.*

New York, April 15, 1885.

The above Report of the Special Committee on Architectural Journals, appointed at the meeting held March 18th, ult., on the Memorial of the Rhode Island Chapter was accepted, and the said Committee given power to amend and print. Geo. C. Mason, Jr., *Secretary A. I. A.*

It will be seen, when the above-mentioned Memorial is read, that the Committee of the Board of Trustees had thrust upon them a task of no little delicacy, and that they have extricated themselves from the situation with a tact which we believe will exact the admiration of our readers as it has ours. Of the preamble which introduces the subject-matter of the report we will only say that had we been the writers we could have found ground for saying even more complimentary things of each of the publications mentioned, particularly of those published in Chicago, which in many ways deserve even more praise than is given above.

The Memorial of the Rhode Island Chapter A. I. A. is as follows: —

Providence, R. I., March 14, 1885.

Messrs. J. R. Osgood & Co.: —

Gentlemen, — At a meeting of this Chapter held last evening it was voted that the Secretary be instructed to write you, to see if a higher tone and wider scope cannot be infused into the editorial conduct of the *American Architect,* and also to forward a copy of this letter to the Board of Trustees of the American Institute of Architects. All our members are subscribers to this publication, and feel that it can easily be made a greater power for good to the entire profession, and that the issue of no other American architectural journal is required, if the interests of the profession are properly considered by your editors.

We feel sure that you do not desire it to degenerate into a simple advertising medium of such products as are required in building, or to become a reprint of foreign publications, but that it shall be a living exponent of the best work and thought of the profession in this country.

We feel sure that you will consider that your best interests lie in the direction of the greatest satisfaction to your subscribers, and therefore express our convictions in this frank manner.

With earnest hope for your continued success in this publication, I remain, Gentlemen, Yours truly, Edward I. Nickerson, Secretary R. I. C. A. I. A.

The only special reason we have for taking exception to this document is the fact that it was addressed to the publishers without any previous warning, remonstrance or complaint on any score having been communicated to the editors, and so the matter has a wholly unnecessary air of tale-bearing. As to recommendations and remonstrances, we are glad to receive them, whether from single individuals or societies, and we accord to these as much attention and consideration as we should to the opinions of any other body of ten members of the profession.

There are points both in the Memorial and in the Report which seem to require, disagreeable as all personal explanations are, comment at our hands, and if the result is a more hearty coöperation in our efforts on the part of the profession no one will regret the action of the Rhode Island Chapter, certainly not ourselves.

If to its characterization of the editorial conduct of this journal the Committee had added the adjectives "impersonal" and "impartial" we could have conceived no character we would so gladly have accepted. Consistency is so difficult of realization and so almost impossible of definition that we would not think of laying claim to its derived adjective. But the impersonality of our efforts we do value: we have no desire to be known as the editors of the *American Architect* — and we are actually known as such by very few — and so far as real usefulness is concerned it makes no difference to our readers whether we are Brown, Jones or Robinson. It is the impersonal journal that speaks and acts, and if we can succeed in impressing that feeling on its readers the journal's words and deeds will be more potent than if associated with the remembrance of our personalities. Impartial in our words and deeds, so far as it is humanly possible, we do insist that we are.

Independence, impersonality, impartiality: when this journal is recognized as having these three virtues we shall be satisfied with its character; these can be secured and maintained by force of will, and with these for a background we feel that much may be excused to the lack of literary skill, professional ability or common sense which at different times may overtake editors as other fallible beings.

As to the somewhat indefinite charges — we will call them such — which have been brought against us, — partly we suppose because the American Institute of Architects years ago adopted the *American Architect* as its "organ of publication" and we are, therefore, supposed to be subject to its discipline — we will reply with the feeling that with nearly ten years of personal experience behind us we know as well as most what it is *desirable* to, do while we have a far better knowledge of what it is *possible* to accomplish.

We believe the complaints have been lodged in forgetfulness that we have not at command the sinews of a great daily, the abounding treasury, the full staff of editors and specialists, the large corps of paid reporters and correspondents all over the world. No; our resources are limited and are largely dependent on the good will and coöperation of the profession, and we conceive that what we do accomplish is therefore rather a matter for gratulation than for censure.

From the more specific remarks of the Committee we infer that it has received personal information as to the exact grounds of complaint which do not appear in the Memorial, and we will take them up in order.

[A.] "It is said that in its pages the technical part of the ordinary practice of an architect is too much neglected."

In any given issue, yes; perhaps even in the four or five numbers which go to make up the issue for a month, which, of course, should be considered together when making a comparison with the other journals mentioned, which are all monthlies. But in the complete yearly volume we believe that the technics of architecture will be found to occupy its proper relative space. What are the matters in which an architect is interested? Architecture, construction, archæology and the history of art, art itself, decoration, mechanics, law, chemistry, sanitation, civil engineering, biography, æsthetics, the lighter gossip of liberally educated men, and matters of daily interest and occurrence. This is a large field, and a well-balanced journal cannot afford to neglect any of these divisions for the sake of cultivating any one of them to the degree pleasing to a fraction of its readers. A glance through the index, however, will probably show the existence of an unsuspected mass of material appertaining to each of these branches which does not make a vivid impression as it appears week by week.

[B.] "It has issued large sheets of details in former numbers which were very acceptable to its patrons, but lately this practice has been more or less abandoned."

We continued to issue these detail-sheets in the face of a very pronounced opposition, and gave them up only when we felt it unwise to insist longer that they were valuable when so many people told us they were a nuisance.

[C.] "So if there now exist any grounds for these animadversions, the patrons of the journal have the remedy in their own hands."

To a very large degree. A vigorous coöperation would unquestionably be a great benefit to editors and subscribers.

[D.] "It is added, however, that a great many drawings of an interesting description, illustrating important buildings in a practical way and offered by prominent architects, are constantly being rejected by the publishers. [read 'editors']."

We might claim this statement as a striking proof of our impartiality of action, for one does not "constantly" reject the work of "prominent architects" if by any possibility the glamour of the prominent architect's name can be made to impart lustre to an issue of such a journal. On this point let us see what the statistics say. We find that in the last two years three hundred and forty-seven drawings only have been submitted to us for publication, and we have felt constrained to decline but ninety-four, or about twenty-seven per cent: this is a much smaller ratio of "rejected addresses" than exists in the management of the London architectural journals, as their editors have informed us in times past. Of the ninety-four rejected drawings, thirty-eight were "first offerings," forty-nine were contributed by architects who had previously had designs accepted and published, the small balance were offered by men who though having offered drawings at different times had never had one accepted. As to the classes of buildings represented by the ninety-four drawings we find that fifty depicted dwelling-houses, seven churches, five shops, three apartment-houses, three town-halls, two court-houses, two hospitals, and the rest were scattering. We will let these facts tell their own story in connection with those designs which have been published, which in themselves are evidence that we considered them better worth publishing than those which were declined. We will only add that as we look over the list we fail to recognize the "great many drawings of an interesting description, illustrating important buildings in a practical way and offered by prominent architects," which the Report mentions.

[E.] "It is very important that all representations should be precisely in accordance with the true nature of the facts."

This seems to imply that the representations we advance are not in accordance with facts, or in other words, that we are or have been guilty of wilful perversion of the truth. When specific instances of our moral obliquity are advanced we will see if anything can be said in palliation.

[F.] "Complaint has been heard that in some respects a not sufficiently clear discrimination has been made in the credit given to architects of noted buildings as to the relative share of merit due to them in their construction."

Apparently we are here accused of saying that some certain architect designed a building which was actually the work of another. No grievous injustice, surely, in such a mistake as this, which could only have been made in a state of ignorance in which we still are, unless we denied the injured architect the right to correct the error in our columns.

[G.] "And also that an exercise of more comprehensive views in discussing many questions of vital interest to the profession would be very desirable."

Unquestionably, but, alas, just at this point the limitations of the editorial capacity must be taken into account. Fortunately, perhaps, while we may hope the *American Architect* is immortal, the editors may be expected to pass away and make room for these "more comprehensive views" which we realize are always desirable.

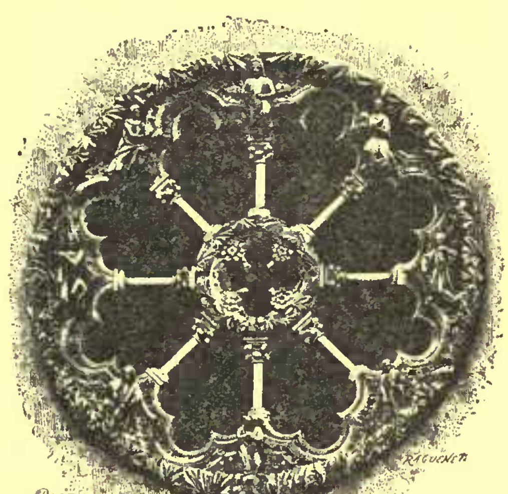
On comparing the demands of the Memorial with the replies of the Committee we seem to discover that the "wider scope" demanded is understood to mean that we are to *restrict* our efforts to expounding

"the technical part of the ordinary practice of an architect," while the "higher tone" is to be achieved by undiscriminatingly accepting the offerings of "prominent architects."

When all is said, we are unqualifiedly grateful to the Committee for its appreciative criticisms, and we are not less so, bar the matter of address already mentioned, to the Rhode Island Chapter, whose Memorial we accept as honest, well-intentioned and in no way instigated by personal pique or malice, as such complaints sometimes are, since we believe we have given no cause for such feelings, either through rejecting manuscripts or drawings, for the simple reason that of late years, save in the case of the Secretary of the Institute, Mr. Mason, none have been offered.

But, we will ask the Rhode Island Chapter, have you ten men done what in you lay to give the journal a "higher tone" and a "wider scope?" Have you ten men performed what the Committee points out to be your duty — by contributing "promptly and steadily by literary work, drawings and subscriptions" to the maintenance of the journal? and we put the same question to every other body of ten men who feel that the editorial management of the *American Architect* is unsatisfactory, and consequently a fit subject for complaint and discipline.

THE FIRST MONOGRAPH OF AMERICAN ARCHITECTURE.[1]



ROSE OF THE FOOLISH VIRGINS XIII CENTURY BRUGES CATHEDRAL - FRANCE

THE first of Messrs. Osgood & Company's promised series of monographs of American architecture is that of the new building of the Law-School at Cambridge, called Austin Hall, from its donor, Mr. Edward Austin. (The official title of the school, by the way, is not the Harvard Law-School, we believe, as appears in the title-page before us, but the Dane Law-School.)

The publication consists of eighteen large heliotype plates, in a neat portfolio, which include views of the building from all four sides, plans of both stories, two or three interior views, enlarged views of the most striking parts of the exterior — the porch, the staircase turret, the outer vestibule, — and several sheets of details at a large scale. All these, except of course the plans, are heliotyped directly from the building, and printed from gelatine, so that they have the qualities and advantages of photographs from nature. The execution of the work is all that could be asked. The points of view are well selected, and the selections give all the characteristic parts of the building. The scale is sufficient to show everything satisfactorily; the plates are well-lighted, singularly free from distortion by the camera, printed with admirable clearness and the right weight of tone. It would be hard to offer a more encouraging example of the kind of work to be expected in this series. For architectural ensemble on a considerable scale one cannot ask anything better done than the general view of the porch, No. II; for presentation of detail, the capitals and other sculpture in Plates IV–VIII are exemplary. The only improvement which it occurs to us to suggest is that the ink with which the plates are printed might be tinged with a warmer pigment, not enough to give color, but only to dissemble the pallor of tone which is in the heliotype its point of inferiority to the photograph.

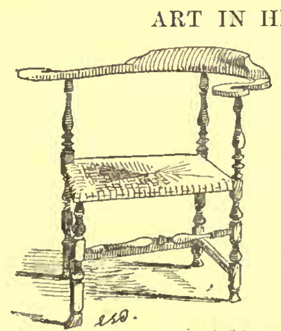
The subject selected for this first number is interesting in itself, and should be, especially to the young architect, valuable as an example of qualities in design which are conspicuously absent from the average of American architecture — we may say from most of it — mass, simplicity, proportion and concentration. The architect may have his own feeling about the style, characteristic of Mr. Richardson, in which the building is conceived; we like it, others may prefer a different style. But the qualities of design are independent of style, or may be, even though some styles court particular qualities more than others. Here, we think, the architect will admire the simple unity which is maintained throughout the composition, the care with which all the wall-space which can be saved in the fenestration is made to tell by continuity, and the many windows are thrown together into masses made effective by contrast. Simplicity, economy, and an effect at once of dignity and richness are reconciled by condensing the ornament into a few places, and there employing it without stint, in contrast with a marked plainness elsewhere. The proportions of the great triple-arched porch are admirable; the subdivision and enrichment of the heavy archivolts is excellently managed; their broad band contrasts most effectively with the mosaic of the wall in which they are set.

To some eyes the dominance of horizontal lines and low dimensions may seem excessive. The fastidious designer may object to the proportion of the horizontal divisions of the wings. He will wonder what the lonely pilaster is doing on the flank of the left-hand arch of the porch, where its only office seems to be to stop the mosaic in the spandrels of the arches — cut in two by the thin line of light stone which prolongs the sill course of the wing, but perhaps costing more in breaking up the wall-space of the central mass than it saves by connecting it with the wing. He will think that the upper and lower divisions of the windows over this wall-space "swear" at each other a little. He may wish for the pleasant contrast and repose of a fair smooth frieze instead of the rough split stone, especially over the carved panels on the ends of the building and the foliaged capitals of the wings. He may wish the capitals of the main porch a little less lumpy, and their carving more accentuated by points of shadow. But these are details, and he will turn back again with interest and satisfaction to the general aspect of the design, to his pleasure in its union of vigor and refinement, its breadth, simplicity, and dignified reserve.

A quarter of a century ago it would have been idle to attempt a series of American monographs such as these. Now we are getting a considerable store of buildings which are worthy not only of reproduction in sketches but of detailed illustration. It is not altogether easy to choose between those which are interesting in general aspect and those that will repay deliberate study, or to draw the line between the lavishness of illustration that makes the buyer needless expense and the chariness that stints; but if the selection keeps pace with the execution as this example fixes its standard the series will be admirable. The work of most architects, especially of those whose manner is not yet fixed, is influenced far more, and their interest more engaged, by the things that are done about them than by those that are recovered for them from the past.

[1] *Monographs of American Architecture.* I. Austin Hall, Harvard Law School, Cambridge, Mass. H. H. Richardson, Architect. Boston: James R. Osgood & Company, 1885.

ART IN HIGH MONUMENTS.



Old Chair at Soldiers' Carnival. Boston: Mass: April 1885.

IF art as expressed by public buildings and monuments were only a matter of fancy, contributing nothing of any permanent value to individuals or peoples, instead of its being so much an inborn longing of our nature as to be a necessary condition of civilization, it might well be disregarded according to the whim of the moment or the occasion of its use. As, however, it is a part of ourselves and will not be set aside, its study as applicable to the construction of our public buildings and monuments, and also to private dwellings as well, is a subject of the deepest interest to all. Yet it is not too much to say that the greater part of the architectural and monumental structures of the country are erected with but little reference, so far as external appearance is concerned, to anything more than the piling up of a desired amount of masonry, or the setting up of a given number of effigies called statues. The monumental structures of the old world which have charmed mankind for centuries, some of them costly, others quite inexpensive, but over whose construction art was equally dominant, have not their counterparts here. Is this because we are not an art-loving people? Not necessarily. We *are* art loving, but in our slip-shod way we allow the enemies of art, or its honest but ill-advised aiders and abettors to control in the management of the erection of public buildings and memorials. Nor can this state of things be easily changed. Monuments will continue to be erected, and buildings built, by so-called art committees, with no element of art in their construction. It is, nevertheless, the privilege of the writer on art and also his duty to call attention to this lamentable condition of public art and to point out, as best he may, the path towards wholesome reform.

One of the mistakes we make in discussing the subject is to imagine that the tendency for large pieces of stone, high buildings, and rapid execution are indications of a true and healthy development of art feeling. To an occasional recommendation in favor of a stricter allegiance to certain principles of art that are common to all the great structures of the world, the reply has been, "We do not care for art as you artists understand it, and we do not care what artists think about it, but we do care for something big, bigger than anything else that has been put up, and different. We want to please the people." Such men little think that only true art will in the end "please the people." The false will in the long run be discovered and condemned by the "plain people." He makes a self-accusing excuse who apologizes for giving "the people" less than the best in everything pertaining to art, on the ground that they are vulgar, and that their tastes must be pandered to, because they cannot appreciate the best. If there be loyalty to fine things and an ambition for their production and possession, it is to be found with "the people." It is very evident that we must depend upon them, and not upon money-getting schemers, or persons ambitious of gaining political or social

distinctions through their advocacy of art if we are ever to have public edifices and monuments that shall be works of art.

In support of this love of true art by the people, a recent report of a committee on design for a national monument truly says, "The peasant equally with the scholar stands impressed and silent before the Sistine Madonna, the Venus of Milo, and the Lion of Lucerne." With equal truth might the committee have added, the Tower of St. Mark's at Venice, the Triumphal Arch at Paris, and the Pyramids of Egypt. True art appeals alike to the educated and to the unlettered. It touches the heart of the king, if he has one, and of his meanest subject. It reaches them, too, through a lovely picture, a grand pile of masonry, or the verses of a poem. Only the art must be there and it must be real.

Incidentally, it may be remarked that the Lion of Lucerne owes its reputation largely to its gigantic size, the tragic incident it aptly commemorates, and the enthusiastic praise of admirers hardly well informed in art. As a work of art it does not compare with the Madonna or the Venus cited by the committee, nor even with the Lion of the Bastile Column, by Barye. The Lion of Lucerne belongs to the class of monumental productions which symbolize events, acts or emotions. They are not, generally speaking, wholly destitute of art, but from various causes; sometimes through their lack of the highest conception of the subject, sometimes through inadequate execution, sometimes through their want of adaptation to their localities, and sometimes for other reasons they always fail to reach the realm of high art.

But size alone is not art. The works of art of large size just alluded to, impress the mind, not simply because they are large, but because they possess certain art elements as well, — of these are simplicity and severity, and when massive structures contain these elements they take a hold on the mind that no amount of tawdry ornamentation can produce. On the contrary, such ornamentation produces the opposite effect. There is an impressiveness in the concentration of the mind and eye upon a simple form that goes up into the air far exceeding that produced by almost any other object made by the hand of man. The reason is, it is more readily grasped, its appeal is more personal, its effect more direct. This simplicity, however, should not degenerate into mere mechanical skill. Art begins to depart then, though it may leave behind something of majesty and grandeur still. A notable illustration of this fact is furnished by the Washington Monument. Could this have attained the art which the Egyptian put into the obelisk, its glory would have been greatly heightened. Had it been treated as a piece of architecture in those respects which distinguish the obelisk from mechanical workmanship, and the towers of Italy from piles of masonry, its artistic character would then have asserted itself, and its power would have been correspondingly greater.

Some of the reasons why it is believed that Egyptian obelisks and the famous towers of Italy and other countries are works of art and not forms of masonry however skilfully executed are that the artists who designed them considered two facts, matter and light; while the modern builder considers one only — matter. The first built with an understanding of the effect of light upon a form erected in the air, the second simply with reference to a mass of masonry as proportioned by a drawing on paper. The effect of the light upon such forms as towers, columns and obelisks in changing the appearance of their sides, surfaces and defined lines, and of their height, when made without reference to certain principles of art is well known to artists, as it is also known that certain forms will appear better in the air than others. The entasis, which, when correctly executed makes a column instead of a cylinder, finds its counterpart in the treatment necessary to make a fine tower, obelisk or building. This treatment is seen in all fine large statues; it belongs to the highest range of art, and constitutes art in high monuments.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

COMPETITIVE DESIGN FOR A STABLE, SUBMITTED BY "*Cabby.*"

TO be built on piers of hard brick 12″ square. Chimney and manure-pit also of hard brick. Sills, 4″ x 12″; posts, plates, etc., 4″ x 6″. First-floor beams (framed into sills), 2″ x 12″, 16″ on centres. Second-floor beams, 3″ x 8″, 16″ on centres. Lower part of first floor, 10″ weather boards. Upper part of first floor, 5″ novelty siding. All the other outside work to be shingles laid on spruce lath. Floors on first story, 2″ spruce; floors on second story, ⅞″ spruce. Ceil all the first floor and coachman's room on second floor with ⅝″ beaded ceiling boards. Stalls and mangers of 2″ plank planed both sides. Mangers to have iron angle-rail on edge and cast-iron feed-box. Stalls to have cast-iron gutter in floor. Provide vent with shutter to be operated with cords from first floor. Water-tank to be of 2″ plank bound with iron hoops 3″ wide. Cast-iron sink in stable-room and wooden water-trough under shed to be provided with water from tank through lead pipe with brass bibbs. Line gutters with tin and provide leaders to, and overflow from, water-tank. Lay tile drain from sinks and overflow to cesspool of present house. Lay tile drain from stall gutters to manure-pit. Provide harness-room with all necessary hooks, etc. All wood-work usually painted to have two coats of paint.

Carpenter work,	$1,340.00
Mason work,	80.00
Architect's commission,	70.00
Total,	$1,490.00

Proposed by A. H. Vreeland, Carpenter and Builder, 107 to 113 Garside Street, Newark, N. J.

THE ALLYN MEMORIAL, SPRING GROVE CEMETERY, HARTFORD, CONN. MR. A. FEHMER, ARCHITECT, HARTFORD, CONN.

THIS memorial was built for the late Mr. T. M. Allyn, of Hartford, Conn., by the New England Granite Works. The models for the four statues on the corner buttresses and for the architectural carving were made by Mr. Carl Conrads. The statue of Christ on entrance porch was executed after Thorwaldsen's model. The building is of Westerly granite, part rock-faced and part tooled; the statuary is of Carrara marble. Internally the walls are lined with pressed-brick, with mouldings of terra-cotta. The ceilings are groined; the floor is of encaustic tiling, and the windows are of stained-glass. The crypts are placed under the floor in the rear apse.

CHRIST CHURCH, DANVILLE, PA. MR. H. M. CONGDON, ARCHITECT, NEW YORK, N. Y.

THIS church was built as a memorial of the late Peter Paldy, of Danville, Pa., from a bequest of $50,000, left by him for this purpose. It takes the place of an old building on the same site, and is built of local stone. Everything is of masonry inside and outside; the window-traceries of stone. Open-timber roof. No paint or plaster. The walls are lined with colored brick. The pews and chancel furniture of oak. The seating capacity is about 500.

ODD FELLOWS' HALL, CAMBRIDGEPORT, MASS. MESSRS. HARTWELL & RICHARDSON, ARCHITECTS, BOSTON.

THE Cambridge Odd Fellows' Hall is just completed, at a cost of about $34,000. It contains, above the stores, a hall to let for entertainments, two for use of Odd Fellows, with a small club-room, ante-rooms, banqueting-room, etc. The front is of pressed-bricks and terra-cotta.

LIVERY STABLE FOR THE DEVON INN, ON THE LINE OF THE PENNA. R. R., FOR SAMUEL COFFIN, ESQ. MR. W. BLEDDYN POWELL, ARCHITECT, PHILADELPHIA, PA.

CATHEDRAL OF ALL SAINTS, ALBANY, N. Y. MR. R. W. GIBSON, ARCHITECT, ALBANY, N. Y.

THIS drawing shows the west front as it is now intended to build it.

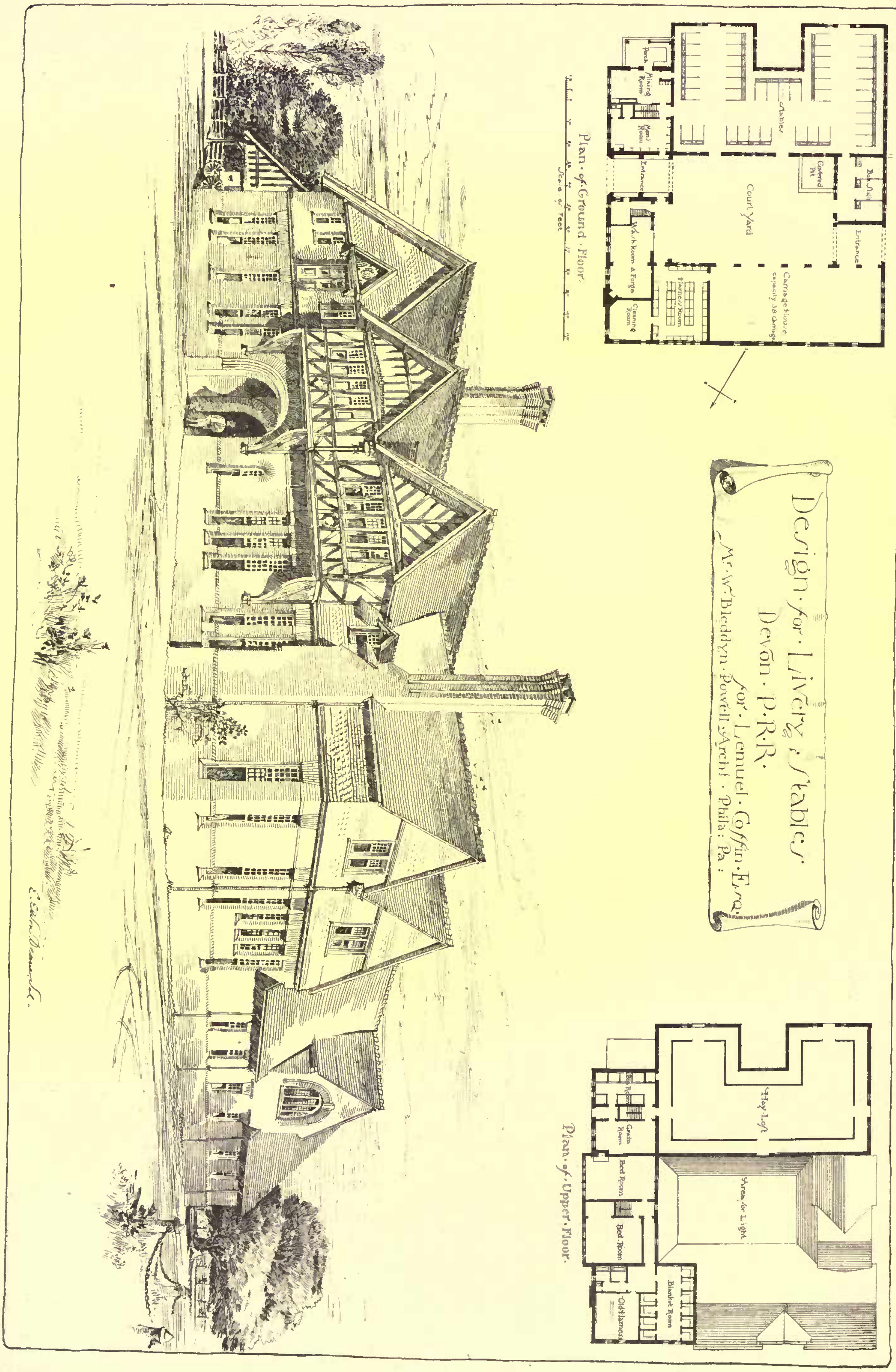
PLASTER IN SCULPTURE. — II.[1]



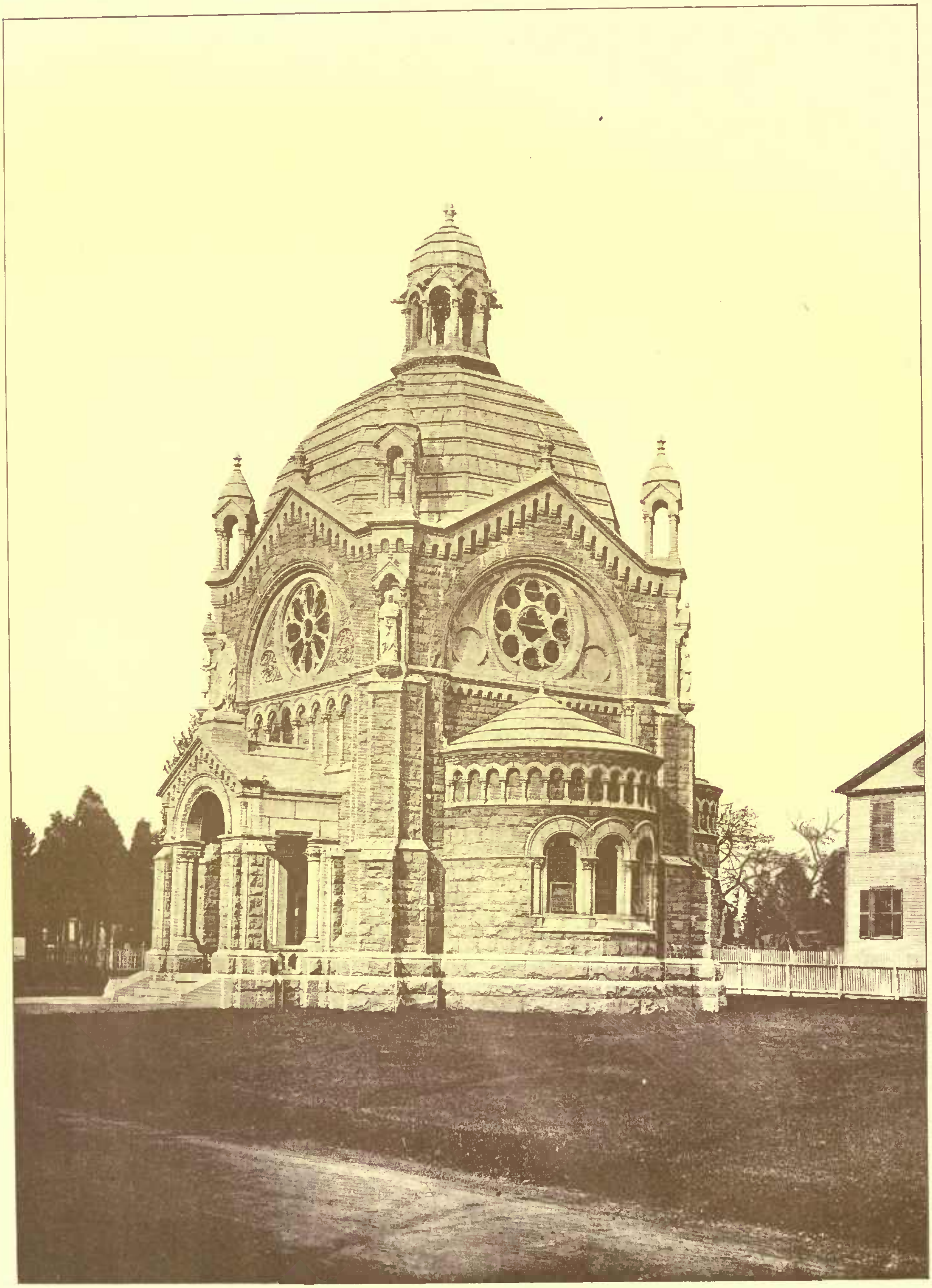
NO adequate estimate of what the Berlin collection of casts has done for the public can be derived from such dry facts as that the objects represented now mount high above two thousand, for vacant numbers alone give no idea of the riches of form and opportunities for noble enjoyment and deep study here ever present. Now the once roomy halls and capacious compartments have become so full that the sense of a crowd unduly packed too often detracts much from the full enjoyment to be derived from this magnificent collection. But this temporary evil is soon to be remedied, it being decided to give up a large and valuable island in the heart of Berlin to her art treasures. Thus, with the paintings and original sculptures now owned by the city, this unrivalled collection of casts will also be better able to irradiate its fulness of enjoyment. Statistics are not at hand to tell of the thousands who yearly seek pleasure and profit among these reproductions of antiquity, but a glance at the happy faces and devout mein of high and low who crowd these halls assures us that the influences emanating thence are not trivial or ephemeral. Every day in the year (excepting the inevitable house-cleaning Mondays) these hospitable courts are open free of cost to all, and on week-days it is common to hear, not the hum of voices, but the rush of many feet, and to see large schools of boys moving about, now pausing before the image of some great historical hero, now before some other work of art, and all listening with delighted attention to the explanatory words of teacher or friend.

Older students, too, are always to be seen, all absorbed in study, with note-book in hand, or flocking about some professor of world-wide fame, to learn here, practically, the methods and workings of the modern science of archæology. Here ladies, with attendant footmen.

[1] Continued from page 224, No. 489



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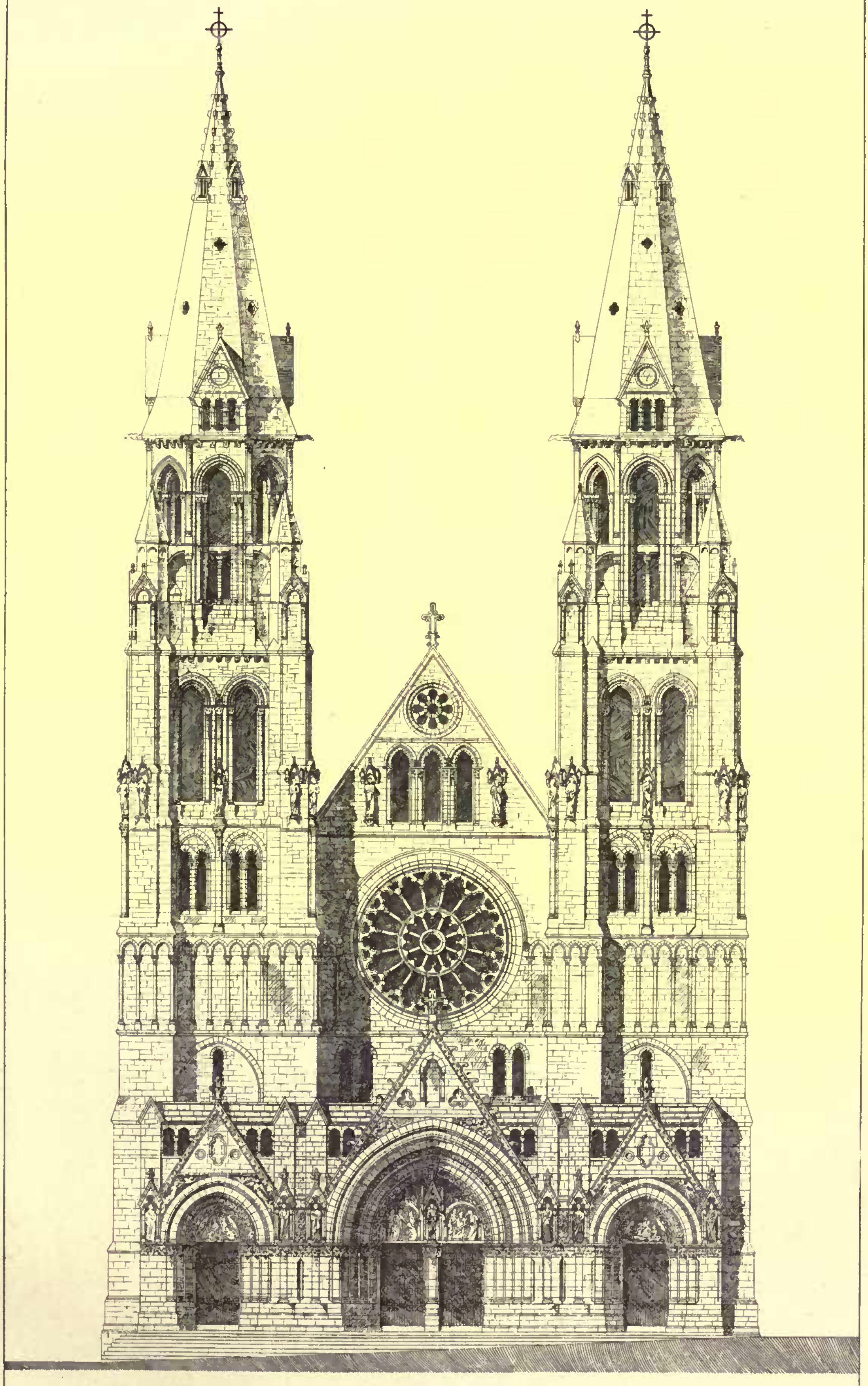
The Allyn Memorial, Hartford, Conn.
A. Fehmer, Arch't. Hartford.



:Odd-Fellows-Hall:
:Cambridgeport: Mass:

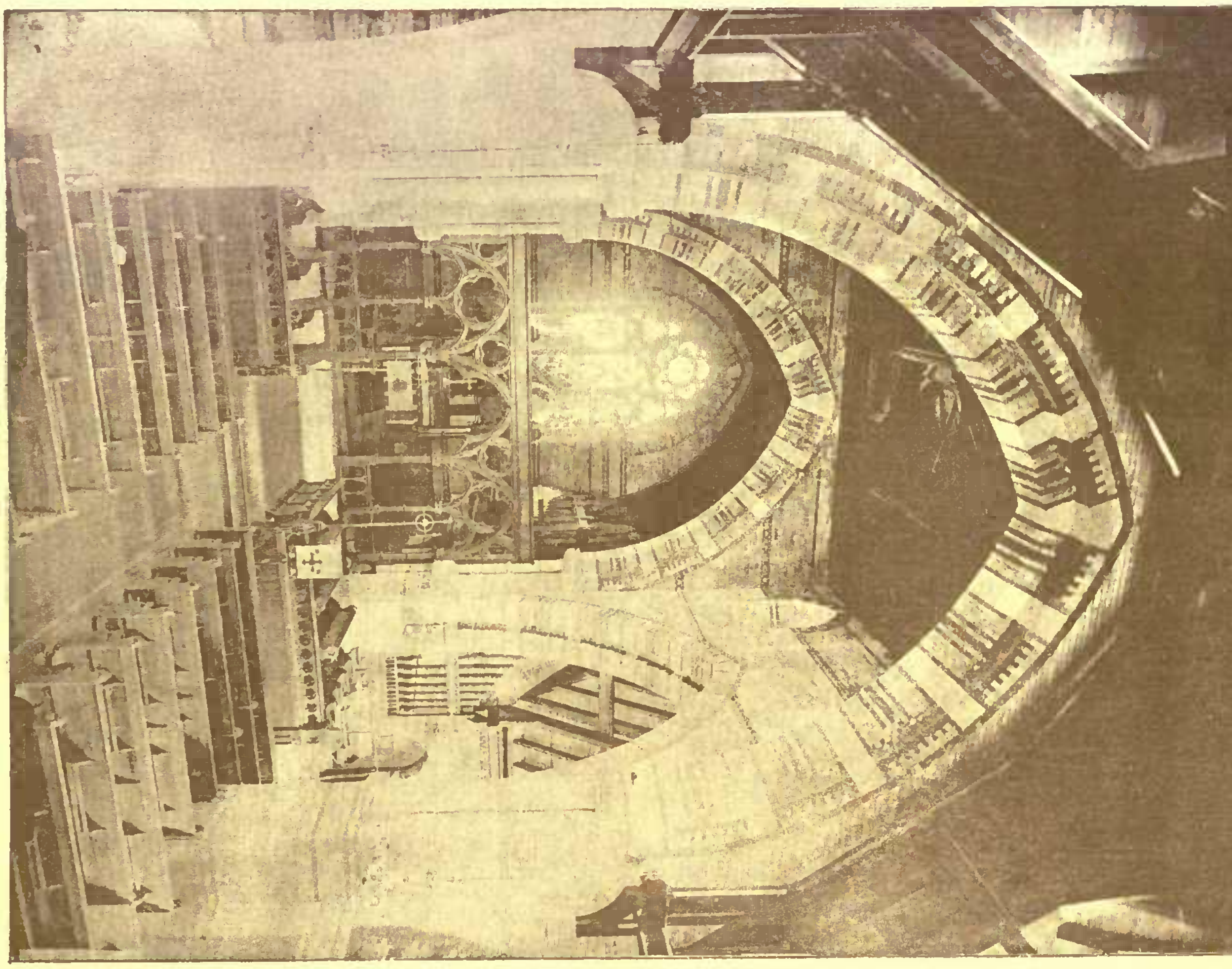
Messrs H:W:Hartwell: and: Wm C:Richardson:
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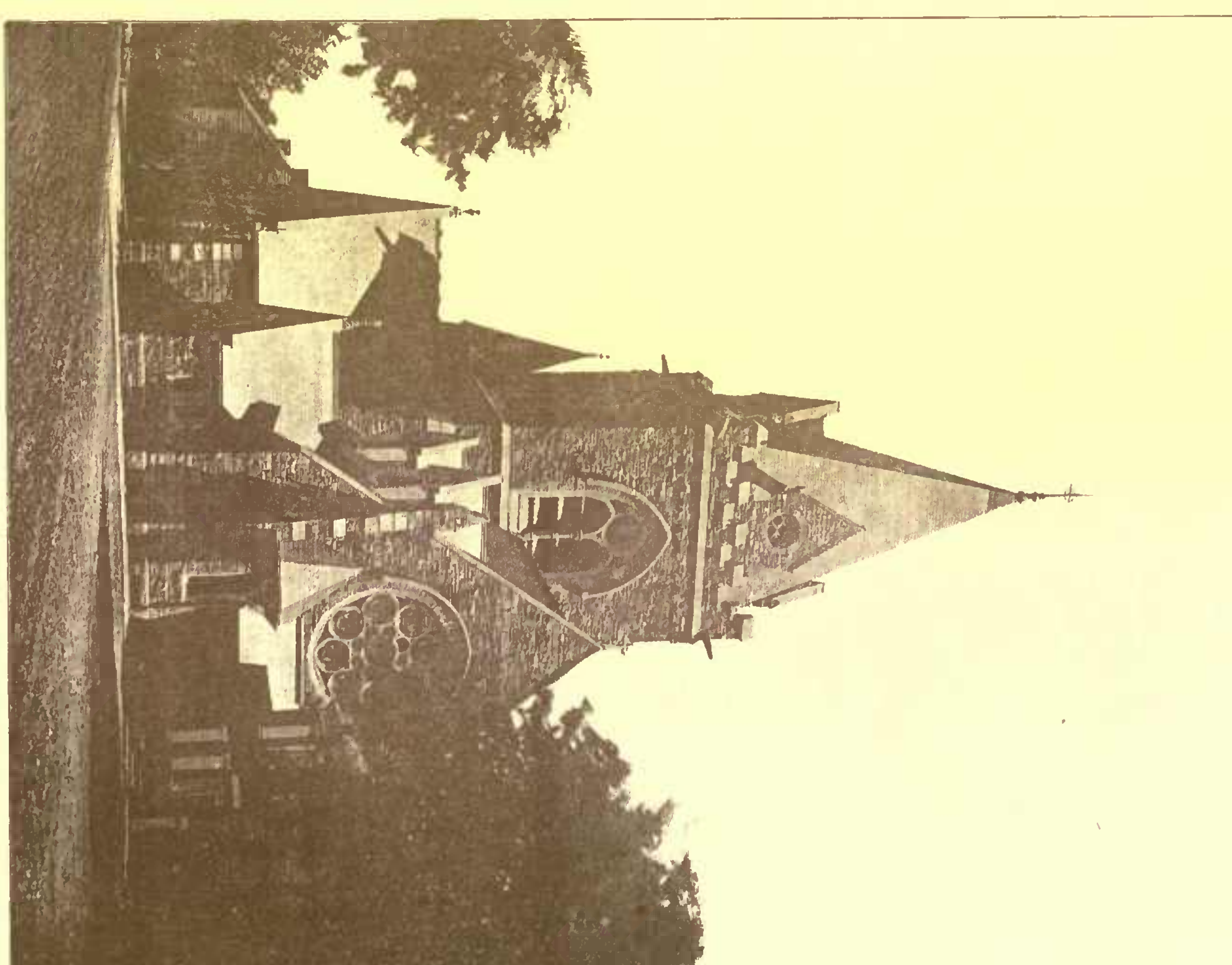
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New: Cathedral: of: All: Saints: Albany: N.Y: West: Front: Robt: W: Gibson: Architect.

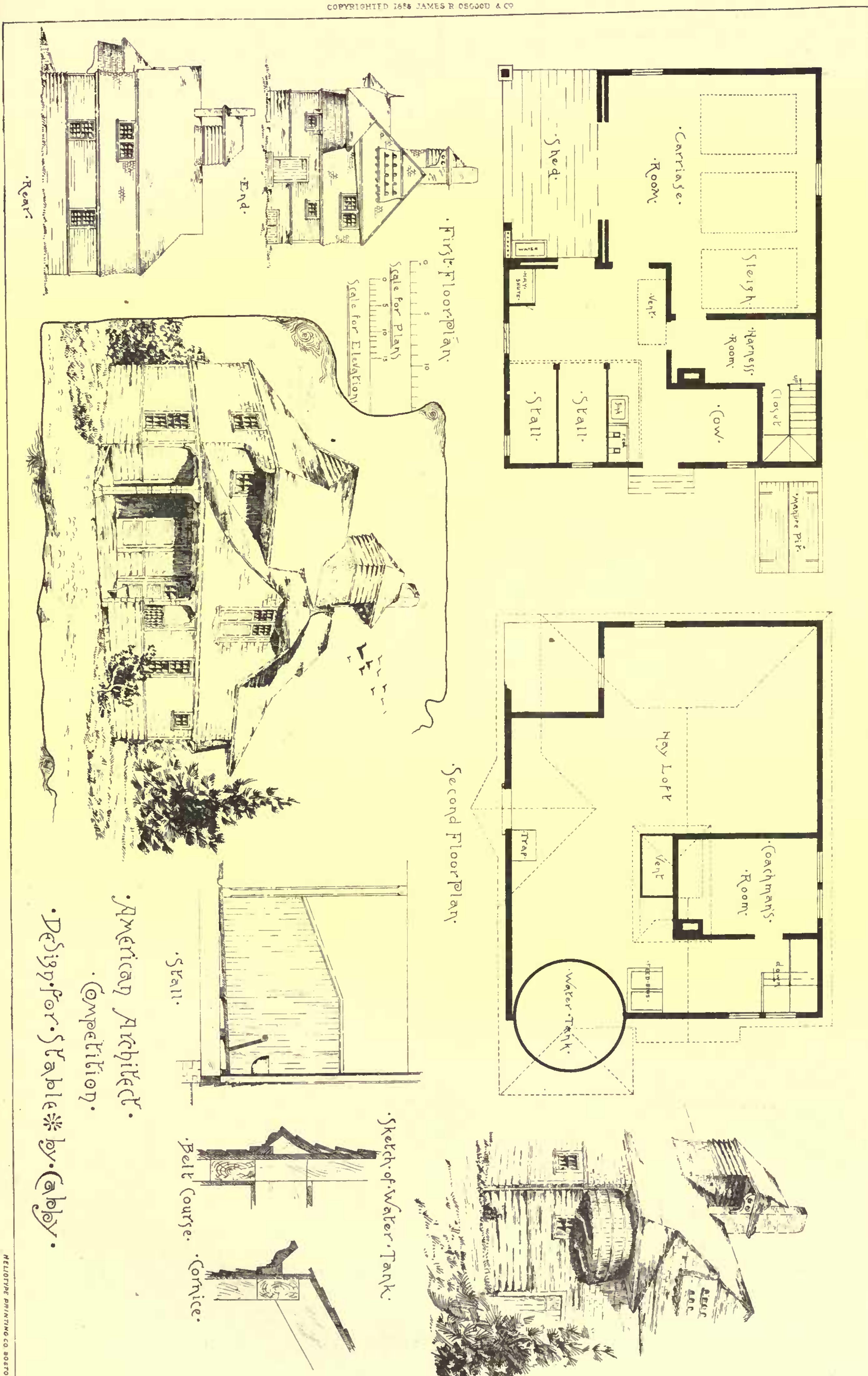
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Christ Church. Danville, Pa. H. M. Congdon, Arch't. New York.

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often saunter about or talk earnestly in knots before some monument, and the words caught as we pass indicate an appreciative sense of what is seen. But not least do we rejoice in what the Museum daily does for the humbler crowd. Mechanic and artisan, with silent, almost awestruck family, plain, bonnetless servant-girls, and more dashing shop-girls, as well as robust apprentice boys, are all here, with a demeanor which is almost solemn, and faces on which is written true enjoyment. The veteran Ernst Curtius, who for nearly twenty years has been connected with the Museum, and gone in and out daily, assured me that the harmony and peace which first filled his being on passing through the collection come afresh over him every time he enters, and may we not believe that what always fills a great spirit with such devout emotion must also roll in myriad waves of less intensity over the souls of these masses?

This collection of casts is, as has been indicated, a great mine for earnest workers in deep shafts of science. Comparison, that firm ladder by which the human mind mounts ever higher and higher in its search after truth, here has very few rounds lacking. Not many are able, with a view to drawing sound conclusions, to carry in mind exact pictures of objects widely scattered in the museums; here, however, the juxtaposition of their casts makes lasting fleeting impressions, and from one monument, standing beside its compeer, light is thrown upon the infinite shades of noble endowment in individuals and races, as well as upon the effects of locality and age upon man's creative powers. Thus the golden chain of progressing human thought appears, linking together inseparably the higher and the lower creations, making them all precious in our eyes. To illustrate, if we chance, in the Berlin Museum, to pause before the casts of two heads, now placed side by side, although their originals are widely separated, the one being in Athens and the other in Germany, the great differences between the art of Greece and of Rome will at once be made clear to us, and the dependence of one upon the other will become delightfully evident. This intimate familiarity with many masterpieces of antiquity, made possible by a generous collection of casts, cannot be too highly prized. Heinrich Brunn, one of the greatest German archæologists of the day, assured me that often in wandering through his museum the statues long said nothing to him, but after repeated visits, suddenly "the scales seemed to drop from his eyes," and a revelation of some hidden truth concerning the workings of artistic genius came to him. To the modern artist intent upon finding the idea of the ancient master from the fragments the cast is invaluable. "To touch the masterpieces," said Canova, when invited to restore the Parthenon marbles, "would be sacrilege," but in the casts experiments may be made without end. Thus, without having tampered with the original, the beautiful and accurate restoration in Berlin of the Nike of Olympia, by Grüttner, reveals to us its grand sweep and harmonious conception. And so, who would not dread to see the massive pieces of the Nike of Samothrace, in Paris, attached to the marble, without careful previous experimenting in plaster. In Berlin casts of these broken fragments have been placed together so as to form a very grand whole, whereas in Paris the original pieces must still lie at the base of the marble statue until experimenting has been completed and the points of juncture have been made certain. The possession of casts may thus open up a field of productive activity to those even who are remote from the originals.

We will not tantalize ourselves by dwelling upon the advantage of possessing such great originals, nor upon the impossibility of transfiguring the cold opaqueness of plaster into the translucent tenderness of marble or the bewitching brilliancy of bronze. But let us remember how great our debt to this humble material. The now widely-extended familiarity with that priceless gift, the Hermes by Praxiteles, we owe solely to plaster casts, for the mellow original still lies, well-nigh unseen, in a secluded corner of Greece. Let us not forget, also, the impression made by these humbler mediums of artistic thought upon so privileged a mind even as that of George Eliot. In her recently published life is the following remarkable passage, written to a friend from Berlin: "We went again and again to the new Museum, to look at the casts of the Parthenon sculptures, and registered a vow that we would go to feast on the sight of the originals the first day we could spare in London. I had never cast more than a fleeting look on them before, but now I can in some degree understand the effect they produced on their first discovery." This "vow" was not an empty figure of speech, for on returning from the Continental trip, we find from her diary that she "fixed on lodgings" on April 23, and only two days later, on April 25, "went to the British Museum," doubtless to see the Parthenon sculptures there preserved.

Casts can, moreover, never be guilty of the distressing untruths often told by copies, whether in reduced or natural size, for between us and the great original there must always intrude in the copy the person of the copyist, while casts are absolutely immediate. The mould from which the cast is formed, being taken directly on the original itself, every beauty or defect must be reflected exactly in this purely mechanical reproduction. Photography, also, and the various processes founded upon it, cannot be as satisfactory in representing large sculptures as are casts, since by a stern necessity of optics the photograph enlarges inordinately all projecting parts, and thus makes shocking and misleading disproportions never dreamed of in the original work. What a boon, then, to mankind the possession of such truthful reflections of the choicest treasures of the past, making possible to all, however remote, a delightful intimacy with the grand outline and touching impersonality which pre-eminently mark Greek art. Plaster casts are, moreover, most inexpensive and consequently within the reach of an eager public.

It is astonishing, in looking over the catalogue of the Berlin Formerei, to find how small the outlay required to purchase very gems of art, and the same is true of those to be obtained in Italy, Vienna or London. To the original cost, I am informed by Herr Geheimrath von Dielitz, Secretary and Treasurer of the Royal Museums, should be added thirty-five per cent for packing and fifteen per cent for transportation. How skilfully, moreover, the packing may now be done appears from the fact that in three thousand five hundred large cases recently sent off by Herr von Dielitz there were only five objects injured in the transport. The casts thus exported are, if desired, prepared with von Dechend's preserving process, at an additional expense of ten per cent on monuments costing originally one hundred marks, but only five per cent on everything above that. The estimates made by von Dechend for providing a museum with his process and thus avoiding this additional per cent are in detail as follows: The machine, which is used both for applying the preserving chemicals and for cleaning, costs, at the outset, four thousand marks; chemicals sufficient for preserving a medium-sized figure, six marks, the amount needed being in proportion to the size of the work, so that for a collection of about six hundred pieces, Dr. von Dechend estimates that the total for chemicals would amount to another four thousand marks. This expenditure of eight thousand marks for a new museum would provide a rich outfit, enabling it to make every new cast coming in, no matter from what part of the world, always safe from the inroads of dirt and moisture. The running expenses of the machine are slight. Two ordinary workmen, or even boys, can manipulate it, as for this purpose no unusual skill is required. Thus, a short time since, when von Dechend was summoned to Cassel to administer his preparation to the whole collection there, two common porters (*dienstmänner*) were called in from the street, and their work was perfectly satisfactory. For the weekly dusting in Berlin more labor is required; two of the regular attendants and three extra workmen being employed every Monday. The expense of this dusting of the immense collection, so large that it can only be gone through with once in six weeks, is thus but five hundred marks a year.

The wide prevalence of museums of casts in Germany has already been alluded to. Paris also has extensive collections: one in the Ecole des Beaux-Arts, and the other in the Palace of the Trocadéro, and London, richer in great originals than any other northern city, has her carefully selected collection in the South Kensington Museum. In America, Washington, Boston, Amherst, Northampton, and other college towns have their collections; Chicago is about to start one, but New York, the home of wealth and poverty, still offers no such privileges to its hungry masses and eager students. How earnestly it is to be hoped that the same wisdom which has elsewhere found it necessary to establish art collections in close proximity to scientific centres, for purposes of higher education, will influence those to whom the interests of the New York public are dear! Our people at large imperatively require ameliorating surroundings, such as are furnished by an ennobling familiarity with the best bequeathed to them by the great past. From the stifling walls of their daily prose life are there not needed wide outlooks upon the smiling fields and sunny slopes of a refreshing art? And with the marvelous reproductive processes of the present at hand, how easy to bring to them such privileges! New fields of thought and deep sources of enjoyment would thus be opened up to them, and powers without doubt now idly slumbering would be awakened to happy activity. A gift of one thousand dollars from a hundred public-spirited men would furnish a beautiful collection of the best produced by classical antiquity. The collection of casts in South Kensington (exclusive of travelling expenses incurred in getting it together) cost only £10,000, and with double that sum how great the possibilities! Besides, the present is the time to make a truly ideal collection.

There are objects in the older museums which might now easily be dispensed with, for as the horizon of our knowledge of antiquity has greatly widened by reason of remarkable discoveries, what was conspicuous and all-attractive forty or fifty years ago, has now come to be of minor importance. We are no longer, like Rafael Mengs and Welcker, confined to the hackneyed reproductions of a late and imitative art, too often disfigured by the restorer's hand. To us there are now opening up in delicious profusion the actual creations of the Greek chisel, from its earliest down to its latest day, and all these still untouched by "shallow botchers," whose unwitting meddling has been so destructive to the priceless art character of ancient objects and so baffling to science. Thus, exquisite tombstones just discovered on Greek soil now vie with imposing temple sculptures in demanding our attention. Altar, public square, and open-air shrines throughout the ancient Greek world, all through the medium of the faithful cast, offer their treasures to our delighted grasp. Would not a wisely-chosen selection of these monuments, set up against a rich background of color, with the high light so necessary to bring out all their luxury and chastity of line, afford our public perennial sources of instruction and ever-ennobling enjoyment? Let these casts, moreover, be so mounted that they can easily be moved about, for purposes of comparison and contrast; let them be sufficiently isolated, so that each object will shine in its own peculiar glory, and we should have a collection of which any city might be proud. From such a beginning, embracing the best in classic art, how easy

then would be the steps toward procuring a library and historical series of electrotype coins, always two of the prime essentials in a working museum! To all these in time there might be made valuable accessions from the art of the remote Orient, the Middle Ages, and the Renaissance.—*Lucy M. Mitchell in the New York Times.*

CHARCOAL.



Statue of Diderot by Bartholdi.

CHARCOAL is a well-known black substance, possessing many peculiar and singular chemical properties. The *puro baso* of charcoal is termed carbon, and the only body in which carbon exists in an entirely pure state is the diamond, the most precious and valuable of all gems; and is so esteemed on account of its hardness, brilliancy, and refractive powers.

Wood charcoal, if well burned and otherwise properly prepared, should be of a jet black color — tasteless, inodorous, porous, and brittle. It cannot be fused or melted in any heat which a common furnace is capable of raising, but under a very powerful galvanic apparatus it is first hardened and then becomes volatile. The ascertained and well-known fact of charcoal being insoluble in water has led to many practical errors in the charring of wood for out-door works and situations where it is alternately wet and dry, under the impression that if charred it is rendered indestructible; while the evident result is, that charring of posts or partial burning only serves to crack and open the tissues of the wood; and unless a liberal application of Archangel or other tar is given, in order to fill up the interstices, an evil instead of a good result is produced by charring posts, etc.

Owing to the peculiarly porous nature of charcoal, it absorbs a very large quantity of common air and has a particular affinity for certain gases. This affinity, according to scientific showing, varies materially and essentially in charcoal produced from different descriptions of wood; hence the special demand and high prices paid for some kinds, to the rejection and low prices of others. The chief distinction and merit of wood for charcoal consists in its hardness and closeness of the grain; but as in some descriptions the sapwood is very soft, and hardwood extremely hard, the value is very materially altered. The sapwood of Oak, for example, is as soft as Ash, while its heartwood is as hard as Mahogany. Taking the best quality of wood, however, of each species, the heartwood of Oak, Laburnum, Sweet Chestnut, etc., and other descriptions, such as Dogwood, Alder, and Birch, the following statement will show pretty nearly the proportionate relative values of the various descriptions of wood for gunpowder charcoal: —

		Per cent.			Per cent.
Rhamnus Frangula	contains	27	Sycamore	contains	19
Lignum-vitæ	"	26	Elm	"	19
Mahogany	"	25	Willow and Poplar	"	18
Laburnam	"	25	Birch and Alder	"	17
Boxwood	"	24	Ash	"	17
Sweet Chestnut	"	23	Hazel	"	17
Oak	"	22	Mountain Ash	"	17
Holly	"	20	Scotch Fir	"	16
Walnut	"	20	Larch	"	16
Beech	"	19			

In addition to the above there are various other descriptions of wood probably of equal value; but as they are little used, and only when mixed along with other sorts, it is impossible to give any reliable information respecting their real value. Although charcoal, as already stated, is inodorous, it nevertheless absorbs both odorous and coloring properties and substances, and is on that account extensively used as one of the best filters and purifiers for water, and as a preservative from decay or putrescence of many animal substances.

Amongst the numerous applications of charcoal, the following may be mentioned: It is extensively used as a common article of fuel, especially for heating hall stoves, bedrooms, etc.; but due precautions must in such cases be taken for ventilation, because after heating, the carbonic acid gas emitted from the charcoal has frequently proved fatal to human life. Charcoal is also extensively used in cooking and in boiling preserves, having the special advantage of producing any necessary degree of heat without smoke or dust. It is likewise used in forges and in extensive iron-works, having the property of converting common iron into steel; and also in the manufacture of wire, in transforming soft into hard, or what is commonly termed bright wire, and is in this respect the only material which has as yet been discovered suitable for the purpose. In the arts and manufactures charcoal also occupies an important place, as, for instance, in the manufacture of ivory black, lamp black, varnish, and black paint, of which it forms the basis; also in the manufacture of ink, in destroying color, correcting or destroying odors, in purifying syrups, honey, etc.; in clarifying wines and other liquors; in deterring putrefaction in meat, and in retaining heat, and also in many medicinal applications.

In farriery, also, it is often used with good effect in the case of cracked heels in horses, when, being finely powdered and mixed with linseed meal, it is used as a liniment. It may also be used in powder in cases of fœtid ulcers, and is then mixed with lard or sweet oil before being applied. Another use to which this useful material is adapted is in the cleaning silver, brass, and copper, when it is combined with other substances, and proves very beneficial. And lastly, it is employed in the manufacture of gunpowder of two classes, commonly termed rock or blasting powder, and gun or sporting powder.

There is yet another but very important use to which charcoal may be applied, and one which is daily and steadily increasing, namely, as a manure. It may be applied in a variety of ways and for many purposes, but the following composition is found to possess the most important advantages for general utility. Take twenty pounds of charcoal, four pounds of night-soil, and one pint of urine, and having mixed them well together, apply in either a liquid or dry state to the crop as weather suggests. If liquid is used, dilute it with tank or rain water; or if urine from the yard is used, add a little quick-lime to correct the acidity. Another excellent mixture for general use is composed of twelve pounds night-soil, forty pounds cow or horse manure, twenty pounds charcoal, and two pounds saltpetre, all mixed together and converted into powder, and sown on the land similarly to bone-dust or guano.

Amongst florists charcoal is extensively used in its simple form, reduced to a fine powder. It accelerates the growth of young, delicate, and tender plants in a marked degree, and encourages cuttings and layers to strike root in a very decided manner. One of the greatest advantages, however, to the florist is the wonderful, nay, almost marvellous, effect it has in heightening the color of flowers.

In the manufacture of gunpowder, it appears that different countries use different proportions of ingredients. "In Prussia 75 per cent of saltpetre, 11½ of sulphur, and 13½ of charcoal are used." "In France 75 parts of saltpetre, 12½ of sulphur, and 12½ of charcoal; while in the United Kingdom 75 parts of saltpetre, 10 of sulphur, and 15 of charcoal are the quantities used." It is to be observed that the proportion of charcoal used in the United Kingdom is greater than in any other country, and this is accounted for from the superior method of preparing it — a method, however, which is partly kept secret by the manufacturers.

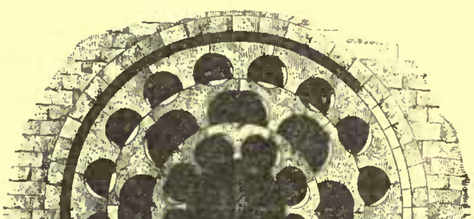
A few statements upon the manufacture of charcoal, or manner of burning it for common use, may, it is presumed, be acceptable to some readers. Charcoal, for common fuel purposes, such as, for example, drying hops, annealing iron, etc., is made from all sorts of wood, including Scotch Fir; but Larch is the most objectionable, and is seldom used for charcoal except sparingly amongst other sorts. While it is stated that all kinds of woods are used it is not to be inferred that all are equally good or valuable, even for subordinate purposes. Some sorts, indeed, are one-third, some one-half, more valuable than others. Hardwood is much more valuable than Pine or Fir, and the hard and close-grained sorts more valuable than the soft and porous. Large wood is not so suitable for charcoal as small wood, both because it is more expensive in the first instance to purchase, also on account of its requiring more labor to cleave, but chiefly because it yields proportionally less charcoal than small wood, weight for weight.

Wood cut for charcoal is generally in three foot or four foot lengths; and if the billets or pieces are over three inches diameter, they are cleft into two or more pieces, according to size of billet. If for powder, the wood of whatever sort is cleanly stripped of its bark, and for either purpose it is stacked up till dry till at least half seasoned, when it is taken down and laid in the following order for charring: A platform is first made of earth excavated from a circular trench surrounding it; the earthy platform is raised six inches higher in the centre than at the margin—or say nine inches deep in the centre and three inches on the outer margin. This platform varies from fifteen feet to thirty feet in diameter, according to quantity of wood to char, the time of doing it, and the condition of the wood as to dryness, etc. In the centre of the circle a round piece of wood is placed perpendicularly, with the small end downwards, and, in point of length, it must be about equal to the radius of the circle. Around this "eye-pole," as it is termed, the billets are laid in a horizontal manner slightly sloping towards the outside, which slope corresponds with the surface of the ground underneath. In this manner, pile after pile and tier after tier are laid till the whole is furnished with a flat, dome-shaped top. After all the wood is laid, a thin coating of straw thatch or turf is laid over it, and a few inches of earth laid over all, and firmly and smoothly beaten with the back of a shovel. The next operation is to withdraw the eye-pole, and fill the space it occupied with some inflammable substance, the best of which is half-burnt embers and charcoal; this is done to the extreme top of the pile, and then it is lighted at top and slightly covered up, but not too much, so as to admit sufficient air to make it burn. The strictest attention is now necessary, by night and day, to regulate and secure an equal fire in every part. This is done by inserting the point of a long pole, like a fork-handle, into any part that appears higher than the rest which admits the air, and attracts the flame to the aperture thus made; and when, at any such aperture, the surface falls too much, the hole is closed up, and another one made in

the next highest part. This operation is continued down to the surface of the ground and till the lowest tier is reached, and as long as smoke issues from the holes, after which it is known that the whole wood is sufficiently charred and is ready for opening. A medium-sized pit requires about six days to burn, and few pits are ever made requiring over six days.

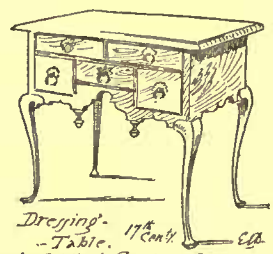
The cooling, no less than the burning, is a very important process, and is done by first providing a large quantity of water and buckets to apply to the fire; then, by means of scrapers and forks the covering is carefully removed, care being taken to prevent any earth from falling in amongst the charred wood. The cooling and extinguishing of all fires requires great dispatch, otherwise exhaustion and waste is occasioned. When cooled, and after all imperfectly burnt pieces have been separated and removed, the charcoal is placed in bags containing two bushels each. The bags, however, are not put into any place of importance for at least twenty-four hours after being filled, in case of any unobserved embers of flame still remaining among them, for such have not unfrequently been known to cause serious conflagrations. — *Woods and Forests.*

PURIFICATION OF SEWAGE.



A DISCOVERY, which has been attended with a measure of success scarcely to have been expected, has been made at the Buxton Sewage Works. In a letter which appeared in the *Leek Times* the other day, it was stated that the sewage of Buxton had been allowed to fall into the River Wye, a short distance below the town, causing a considerable pollution of the river. Mr. Thomas Wardle, who has described the process, observes: "By a happy thought, the result of a number of experiments, Dr. Thresh, D. Sc., of that town, found that by diverting and adding to the sewage a mineral water which rises from the lower coal strata about two miles above Buxton, and which contains 1.2 grains per gallon of iron in solution as ferrous carbonate, and which, on exposure to the air, absorbs oxygen and falls as ferric oxide, coating the surface, as is well seen in the streams and ornamental water of the Buxton Gardens, with a copious precipitate of an ochreous deposit, the purification might be effected." Following out the hint, the authorities, it appears, have conveyed this ferruginous water by pipes to new sewage-tanks, a mile below Buxton on the river. These have been constructed from the plans of Mr. J. Hague, the borough surveyor. There the water is made to fall into the sewage matter with a small proportion of lime-ash, after the more solid portions are screened off as manure. The precipitate which falls to the bottom of the first tank is dense and flaky in character, but after passing through the series of tanks the sewage flows out in a clear liquid, leaving little precipitate in the last tank. A duplicate set of tanks is provided in case of an emergency, or during cleansing. After passing through the last tank, the sewage is made to flow over an artificial waterfall, and from thence over a shallow serpentine bed, where it becomes thoroughly oxidized, after passing which it enters the River Wye, a harmless and clear effluent. The trials made are said to have been satisfactory evidences of the value of the process. Mr. Wardle's analysis, made by Mr. Rigby from Dr. Wanklyn's methods, showed on the first trial the following results: sewage matter before treatment contained of free ammonia 11.74 per million; albuminoid ammonia, 1.60. The purified effluent just before it enters the river contained free ammonia 4.00 parts per million, and of albuminoid ammonia 0.30 ditto. The iron water contains 1.2 grains per gallon of iron, which, as ferrous carbonate, amounts to 2.5 grains per gallon. Both the sewage and purified effluent are said to be distinctly alkaline, the degree of hardness of the latter being 12.2 degrees by Clark's method. From the above statement of the experiment made at Buxton, the authorities of that favored town must have every reason to be pleased with the result. It is said that this is the first time an attempt has been made to treat sewage matter with natural ferrous carbonate, and if so, the experiment which has been so successfully made, ought to become known. Every chemist is aware of the value of oxidizing processes, and that iron may be used as a chemical carrier of oxygen to the organic matter, the iron in solution being first oxidized to the ferric state, and alternately reduced to the ferrous condition. The artificial waterfall is intended to oxidize the liquid. Lately, Mr. W. Anderson, M. I. C. E., has described the purification of water by iron. He proposes to bring the water into contact with a mixture of spongy iron and gravel, and, acting upon a suggestion of Sir Frederick Abel, Mr. Anderson made use of a revolving cylinder with inlet and outlet pipes, and with shelves for scooping up the iron, by which means a large quantity of water passing through the revolver enables it to dissolve a certain proportion of iron. The same authority adds: "By making suitable arrangements and choosing a favorable time with respect to the demands of a town, we were able to obtain samples of water that have been purified by the revolver only after proper exposure to the air, followed by filtration through one of the large sand-filters; the result obtained has been that the color was very little different from distilled water. The free ammonia was reduced from 0.32 grains per gallon to 0.001, and the albuminoid ammonia from 0.013 grains to 0.0045." If the results of the analysis given of the Buxton effluent be correctly stated, the effect of the mineral water in oxidizing the sewage matter has been to rob it of all dangerous properties, and to allow it to fall into the river in a perfectly innocuous condition. The works, constructed from the plans of Mr. Hague, the borough surveyor, have cost the sum of over £3,000, and, we believe, fully answer the purpose.—*The Building News.*

A SUCCESSFUL SUIT FOR COMMISSION.



AS comment on the following case we will say that it seems regrettable that architects do not oftener think it worth while to furnish us with reports of law-suits in which they have the misfortune to be engaged. We are not infrequently asked to give advice on certain points either before or after a suit is brought, but we cannot now remember any instance in which we were informed how these suits resulted. It seems to us that as we ask no payment for the services we render, the architects who in this way lay themselves under these slight obligations to us should feel called on to make their acknowledgments by reporting the results of the cases as to which our advice was asked.

A case of interest to all architects was decided by Judge Stewart in the City Court of Baltimore, without a jury, on April 25 last. A brief outline is as follows: In May, 1883, Mr. A. G. Davis employed J. A. & W. T. Wilson, architects, to prepare designs for a town house and stable, giving his ideas verbally and by outline sketches, also sending them several times to Washington, to examine buildings the features of which he fancied. They submitted several sketches, and after much delay and many changes on the part of the client, working drawings and specifications were accepted, and bids procured for the work, ranging from $48,000 to $60,000. They were objected to as too high, and after some alterations two more bids of $40,000 and $38,000 were received. The client offered one of these bidders $37,000, which was refused. He then employed a builder, who had not bid, to superintend the execution of the work and to let the contracts separately. Under this authority about $18,000 worth of labor and material were contracted for, when in March, 1884, the work was suddenly brought to a close, for reasons best known to the client. The architects then rendered their bill for 3½ per cent on $40,000, the lowest sum which the superintendent said the work would have cost. The client refusing to make payment, suit was brought and a verdict rendered the plaintiffs of 3½ per cent on $25,000. The defense claimed that the architects had been limited to the sum of $20,000, while the plaintiffs denied that any limit, beyond the character and size of the buildings, had ever been given them; showing the letter in which $37,000 was offered for the work. The defense claimed that the builder employed had stated that the work could be done for $25,000, which was flatly denied by the builder himself, who said that it would certainly have cost $40,000. The judge recognized the schedule of charges of the A. I. A., put in evidence by the plaintiffs, and gave his verdict according to its rates, though fixing $25,000 as, in his opinion, the amount which the client really desired to spend on the work, notwithstanding all the evidence to the contrary.

SPONGY IRON.

CHATHAM, ONT., May 8, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Will you please inform me through the columns of your paper, where spongy iron, for filtering purposes, can be obtained: its merits and probable cost? Respectfully, W. F. R.

[Address the Spongy Iron Water and Sewage Purifying Company, London, England. We doubt very much whether spongy iron can be had on this side of the Atlantic in condition suitable for the purpose.— EDS. AMERICAN ARCHITECT.]

"THE EVOLUTION OF THE ELEVATOR."

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — The quotation in your last number from a Germantown paper, as to the length of time passenger-elevators have been in use in this country, is misleading. The writer remembers one at the Fifth Avenue Hotel in New York in the spring of 1863, which was not at that time so great a novelty as to excite surprise.

E. L.

NOTES AND CLIPPINGS.

A Peculiar Test Case. — An apparently trifling, but, in reality, a very important suit has been brought by an obstinate citizen of Frankfort-on-the-Main, against the municipality. He sues for the recovery of one mark eighty pfennigs (forty-five cents United States currency), on the plea that the city has not furnished him the proper quantity and quality of water stipulated by contract. Plaintiff does not consider himself bound to fulfil his obligation if the city does not comply with its own, and hence has brought this test case, which is being anxiously watched by his fellow citizens. — *Exchange.*

The Severn Tunnel.—This year will see the completion of one of the greatest submarine engineering feats ever undertaken in Great Britain. The Severn tunnel was first begun by the Great Western Railway sixteen years ago, and the accomplishment of the great work has been delayed by difficulties which a few years back would have been thought insurmountable. Twice has an enormous volume of water flooded the works, through the accidental tapping of land springs; besides which, fissures in the rock were met with which let the tidal waters into the tunnel. The river is two and a quarter miles broad at the site of the works, but the tunnel itself is nearly double that length, in order to allow for the necessary gradient on either side, the crown of the tunnel being fifty feet below the deepest part of the river. The enterprise has cost considerably more than a million sterling. — *New York Evening Post.*

Wren's Towers. — Mr. John Clayton says: "It will be hardly necessary to observe that Wren's towers and spires were built 'in the most substantial and workmanlike manner,' and to adapt the words of modern specifications still farther, 'the materials used were the best of their respective kinds;' but here ends the similitude. Wren put a different construction on these words from that often given in the present day; with him none of the funds which should be expended in stability were wasted in decoration — a fault which is perhaps mainly attributable to the present defective state of competitions, with which Wren was not troubled. The walls of the towers vary from five feet to seven feet in thickness, and are of solid masonry, sometimes backed up with brick, but generally with stone of a rougher description. The stone is Portland, the timber oak, and the lead must have weighed at least ten pounds to the foot superficial. The floors in nearly all the towers are carried upon corbels, a preferable mode to inserting the ends of the beams in the walls, as the floors are more readily replaced when decayed, and the walls are not so liable to be injured by fire or strains. The towers have in nearly every instance convenient access to the belfry or parapet by circular stone staircases; and it is worthy of notice that the front line of the steps runs to the centre and not to the face of the newel, as is usual in Gothic staircases; this perhaps occasions a little more work, but gives a much better tread."

Exhibition Plans in Paris. — The *Journal Officiel* publishes the report by M. Antonin Proust, president of the commission appointed to organize the Universal Exhibition of 1889. It deals first with the choice of a site. In conformity with the wish expressed by the Municipal Council of Paris that the Exhibition should be on the Champ de Mars, the commission recommends that the site shall include, on the left bank of the Seine, the Champ de Mars and the space extending from the Avenue de la Bourdonnaye to the Ministry of Foreign Affairs, and, on the right bank of the river, the Trocadéro from the Avenue d'Antin to the avenue which bounds the Palais de l'Industrie, on the side of the Place de la Concorde. The *concours*, requiring a wide space, should, in the opinion of the commission, be conducted at Vincennes. With regard to the constructions which are to be erected it is suggested that there should be two great divisions — first, those devoted to purposes connected with the manifestation of ideas; and, second, those devoted to the exhibition of products. The commission recommends that greater development should be given to conferences and international congresses, the success of which was great in 1878. The libraries, laboratories, and halls for the conferences will be placed near one of the entrances to the Palais de l'Industrie. There fêtes will be organized and prizes distributed. In the space comprised between the avenue parallel to the Place de la Concorde and the Avenue d'Antin all that relates to education will be grouped. The Seine will divide the two great categories, the manifestation of ideas being on the right, and the exhibition of products on the left bank. The river will be crossed by a bridge doubling the Pont des Invalides, which by its height will not interrupt the traffic on the right bank. The esplanade of the Invalides will be devoted to the Colonial Exhibition, and to that of living animals, which will only last a fortnight. A part of the Quai d'Orsay and the Quai d'Alma will be the site of the Agricultural Exhibition. M. Tisserand has prepared a scheme for this section, the object of which will be to give exact ideas of the conditions and methods of culture in each country. Two palaces will be erected, one near the Avenue de la Bourdonnaye, devoted to the arts, the other near the Avenue de Suffren, to the sciences. The commission being consulted with regard to the permanency of a part of the constructions to be erected in the Champ de Mars, recommends that these two palaces just referred to should be preserved. It estimates at 50,000,000 francs, the total of the expenses necessary for the various buildings to be constructed and fitted up. The receipts anticipated to cover these expenses are grants from the city and the State, 28,000,000 francs; admissions day and night, 14,000,000 francs; concessions, 15,000,000 francs; sale of the materials, 1,000,000 francs; in all 58,000,000 francs. Thus a profit will be left of 8,000,000 francs to meet contingencies. The commission recommends that exhibitors should be made to pay for the space allotted to them, and that in return they should be allowed to sell their products. The report concludes with a proposal to found an Association de Garantie, with a capital of not less than 10,000,000 francs, and not exceeding 24,000,000 francs, to which, however, no appeal will be made until the 28,000,000 francs have been spent and the total receipts of the Exhibition have proved insufficient. — *Paris Letter to the London Times.*

The Bennington Battle Monument. — The recent meeting of the Bennington Historical Society appears to have been a resolute step in the direction of building a suitably grand monument to commemorate the battle of 1777. This meeting disclosed the important fact that local sentiment is wholly averse to the erection of the artistic innovation which the committee upon design, under the leadership of E. J. Phelps, minister to England, had commended to the Monument Association. The Historical Society declares the fact that it is the parent of the monument association, the procurer of the legislative charter, and principally the acquirer of the large fund, about $85,000, for monument purposes. This fund consists of $40,000 voted by Congress, $30,000 given by the States of Vermont, Massachusetts and New Hampshire, and the balance secured from individual contributions. Inasmuch as none of the appropriated fund is available, owing to rigid charter restrictions, until after the approval of a design selected by the Association and by the President of the United States, also the Governors of the three States named, no interest of consequence has been realized upon the fund, which, created long ago, has awaited the slothful action of the Association in the matter of agreeing upon a design. It is now confidently expected that a design will be decided on in August; also, that prompt action may be taken in building the monument. Much controversy has arisen as to whether the present fund is ample to build a commanding monument, the charter prohibiting any work thereon until money sufficient for its completion should be at the command of the Association. In the opinion, however, of the masses of the people, the present fund when in hand, increased by interest accumulations, will properly build a great structure, imposing, symmetrical, symbolical of the importance of the event and the decisive victory. It is understood that the stone suitable for such a monument can be found near the proposed site, near the old Continental store-house at the Centre village, formerly Bennington proper. It is felt that the majesty of art is a proper conception of all these considerations, rather than simply the contemplation of polished figures, which ignore patriotism, the simplicity of our people, and the noble history of this struggle for liberty. The society at the meeting referred to appointed a committee of forty, with ex-Governor Hiland Hall of your city as chairman, to obtain designs proposed, etc., which committee is a sort of "council of safety" to bring to a successful issue the monument project. The whole tenor of the speeches at this meeting developed unmistakably the earnestness and unity of the members that no mistake should be made, no funds invested, and no dishonor stain the noble undertaking. A. P. Childs of your city was elected, with others, an honorary member of the society. — *Correspondence of the Springfield Republican.*

A Tale of Eddystone Light. — Captain Parselle of the White Star steamship "*Adriatic*" spins the following yarn in the New York *Tribune* apropos of so-called tidal waves in mid-ocean: "About three weeks ago on my last trip back to England we called at Queenstown. There I met my friend, Mr. Thomas Gray, the Secretary of the London Board of Trade, a thoroughly well-known man, whose word is as good as his bond. He told me in good faith the following story and said he knew it to be true: Some time ago, precisely when I don't just now remember, a new light was being put in the Eddystone light-house. This house, you know, stands on a solid rock which the sea entirely covers at high water. The building is a circular iron [*sic*] tower, hollow in the centre, and about nine feet in diameter. The materials which were used to fix the new light were brought by steamers to the rock, and holes were opened in the base of the light-house, through which they were admitted into this hollow space. Then they were hoisted up by derricks to the top of the light-house. One afternoon the son of the architect, a young man just about of age, was standing at the top of the tower, looking down through this hollow space, a distance of 140 feet to the rock below. Suddenly he became dizzy and fell headlong into the abyss. Just at that opportune and Providential moment a storm-wave, such as I have been describing, broke against the light-house. The hole in its base had not been closed, and in the twinkling of an eye, at the very moment the young man fell, the water rushed in through these holes, up the hollow tower, and received the falling form. Receding immediately, the water left him, alive and none the worse for his ducking, on the rock at the tower's base!"

The Pollution of Well-Water. — For thirty-five years past a brewer at Brentwood, England, has drawn a supply of water for his business from a well sunk through clay and sand, and, by means of a continuation of pipe, reaching the chalk layer at a distance of over 500 feet below the surface. A similar well was owned by a neighbor, who, having no use for it as such, converted it into a sewer by direct connection with his drain. The result was that the brewer's well was ruined, the water-supply being common to both. The brewer brought an action against his neighbor, and in the first instance was defeated, but on an appeal to a higher court the decision was reversed, and the principle established that no one has a right to pollute a subterranean water-supply to the injury of another person. — *Hydraulic Plumber.*

Recent Surveys show that the entire city of Virginia, Nevada, has moved over thirty inches to the east since the big fire of 1875. The Maynard Block on Golden Hill is known to be gradually sliding down in the direction of Gold Cañon, and has moved nearly two feet since its erection. This movement is so gradual that it does not affect in any manner the safety of the buildings, as the ground to a depth of nearly one hundred feet to the bed-rock is known to be continually sliding. It is a well-known fact among practical miners that the ground on which Virginia City is built is what is termed a slide, and that it is necessary to sink nearly one hundred feet before finding the natural bed-rock. — *Boston Journal.*

A Building-Law for Cincinnati. — The Builders' Exchange has resolved to petition the Legislature to enact a building-law for this city and to appoint an inspector of building. A committee has been appointed to draft such a law and have it in readiness for the Legislature next fall.

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

BUILDING PATENTS.

[*Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.*]

316,871. LATCH. — Edward W. Brettell, Newark, N. J.

316,875. SASH-FASTENER. — William J. S. Bryan and Ira Bouteil, St. Louis, Mo.

316,895. CONSTRUCTION OF HOUSES. — Alva Hubbard, Baltimore, Md.

316,898. CHIMNEY-CAP OR VENTILATOR. — Moses W. Kidder, Lincoln, Mass.

316,904. BRICK-KILN. — Seth B. Moe, Chattanooga, Tenn.

316,939. BRICK-PRESS. — Joseph R. Bowers, Concord, N. H.

316,940. WINDOW-GLASS FASTENER. — John Braun and Ferdinand Bohn, Buffalo, N. Y.

316,960. PLATFORM FOR FIRE-ESCAPES. — Richard Hammill, Chicago, Ill.

316,962. WASTE-PIPE TRAP AND VALVE. — Patrick Harvey, Chicago, Ill.

316,964. ROOFING COMPOUND. — Henry C. Hawes and James E. Green, 2d, Belleville, N. Y.

3169,66. AUTOMATIC FLUSHING-APPARATUS. — Byron J. Healy, Kalamazoo, Mich.

316,969. FIRE-ESCAPE. — William F. High, Reading, Pa.

316,976. APPARATUS FOR COOLING BUILDINGS, ETC. — Henry C. Johnson, Meadville, Pa.

317,004. MIXED PAINT. — William F. D. Pascoe, James Moller Haines and John Butland, South Easton, Pa.

317,005. HOT-AIR FURNACE. — Lewis Patric, Springfield, O.

317,006. COMBINED OPEN GRATE AND HEATER. — William W. Patton, Philadelphia, Pa.

317,011. TRAP FOR EAVES-TROUGHS. — William B. Porter, Troy, Pa.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report forty-three permits have been granted, the more important of which are the following: —

S. R. Robinson, 4 two-st'y brick buildings, e s Fulton St., s of Baker Circle.

John G. Vaupel, three-st'y brick building, s s Hamburg St., e of Creek Alley.

Wm. Carback, 4 two-st'y brick buildings, w s Chapel St., between Eager and Chase Sts.

E. H. Prosan, three-st'y brick building, e s Pennsylvania Ave., between McMechen and Wilson Sts.

C. Zeigler, three-st'y brick building, s s Baltimore St., between Frederick St. and Market Space.

John Clark, three-st'y brick building, s w cor. Randall and Patapsco Sts.; 2 two-st'y brick buildings, s s Randall St., and 2 two-st'y brick buildings, w s Patapsco St., s of Randall St.

John Behrner, three-st'y brick building, n e cor. Hanover and Church Sts.

Geo. C. Hershman, 4 two-st'y brick buildings, w s Chesapeake St., s of O'Donnell St.

M. Martin, three-st'y brick building (square), e s Charles St., between Hoffman St. and Jones Falls.

J. H. Rosengam, 2 three-st'y brick buildings, n s Sarah Anne St., between Myrtle Ave. and Fremont St.

E. W. Gorman, 7 two-st'y and mansard brick buildings, e s Patterson Park Ave., n of Fairmount Ave.

J. P. Brandon, 2 two-st'y brick buildings, w s Ropewalk Alley, s of Heath St.

S. S. Clayton, four-st'y brick building, s s Fayette St., between Charles and St. Paul Sts.

M. De Athley, five-st'y brick building, in rear n e cor. Eutaw and Camden Sts.

Boston.

BUILDING PERMITS. — *Wood.* — *Saratoga St.*, stable and car-house, 112' x 119'; owner, Metropolitan R. R. Co.; builder, John Quirk.

Pynchon St., Nos. 215, 217, 219 *and* 221, dwell., 20' x 40'; owner, Mrs. Hannah Dudley; builder, Wm. Tobin.

East Third St., Nos. 619 *and* 621, dwell., 20' x 28'; owners, R. & A. Woodsome; builder, J. Hastey.

C St., near Boylston St., dwell., 25' x 45'; owner, Solomon Jacobs; builder, Alexander McDonald.

Call St., near Caroline Ave., dwell., 23' x 32'; owner, James Tirrell.

Williams St., near Forest Hill St., carriage-house, 16' x 34' and 37'; owner, Miss Susanna E. Cary; builder, F. B. Moses.

Cambridge St., near Mansfield St., dwell., 24' and 28' x 34'; owner, Joseph S. Paine; builder, F. W. Stevens.

Blue Hill Ave., near Brookford St., dwell., 22' x 44'; owner, Delia Kerrigan; builders, Gilbert & White.

Brooklyn.

GRANITE CONTRACT. — The contract for stone-work on the Brooklyn Post-office building has been awarded to the Bodwell Granite Company, of Maine, at its bid of $94,000.

BUILDING PERMITS. — *Gold St., No.* 242, w s, 150' s Concord St., four-st'y frame tenement (brick-filled), tin roof; cost, $4,500; owner, Henry Rausch, 244 Gold St.; architect, F. J. Berlenbach, Jr.

Eleventh St., s s, 97' 10" w Fifth Ave., 12 two-st'y brown-stone dwells., tin roofs, wooden cornices; cost, $6,000; owner and contractor, S. B. Oulton, 188 One Hundred and Thirty-eighth St.; architect, — Wirth; mason, — Dunkley.

Fourth St., w s, 25' n North Tenth St., 6 four-st'y frame tenements (brick-filled), tin roof; cost, each, $5,000; owner, Henry Hamilton, 286 Fourth St.; architect, A. Herbert.

North Tenth St., n w cor. Fourth and North Eleventh Sts., s w cor. Fourth St., 2 four-st'y frame stores and tenements (brick-filled), tin roofs; cost, each, $5,500; owner and architect, same as last.

Madison St., s s, 300' w Ralph Ave., 4 three-st'y frame tenements, tin roofs; cost, each, $3,000; owner, Peter Young, 209 McDonough St.; architect and builder, W. J. Conway.

Halsey St., n s, Patchen to Ralph Aves., 45 three-st'y frame tenements, tin roofs; cost, each, $3,000; owner, Peter Young, 209 McDonough St.; architect and builder, W. J. Conway.

Putnam Ave., s s, 300' w Ralph Ave., 12 three-st'y frame tenements, tin roofs; cost, each, $3,000; owner, Peter Young, 209 McDonough St.; architect and builder, W. J. Conway.

Prospect Ave., s s, about 200' e Sixth Ave., 5 three-st'y frame tenements, (brick-filled), tin roofs; cost, each, $4,000; owner and contractor, Richard Chidwick, 404½ Seventeenth St.; architect, W. H. Wirth; mason, O. O'Keefe.

Broadway, s w cor. Bartlett St., four-st'y brick store, tin roof, iron cornice; owner, J. M. Reinhart, on premises; architect, A. Herbert; builders, U. Maurer and J. Rueger.

Park Ave., s s, 75' e Grand Ave., three-st'y tenement, tin roof; cost, $4,300; owner, August Postel, 344 Park Ave.; architect, S. Harbison; builders, P. Sheridan and R. Ford.

Lexington Ave., n s, 350' e Bedford Ave., 15 two-st'y brick dwells., gravel roofs; cost, each, $4,500; owner, Thos. H. Robbins, 178 Garfield Pl.; architect, A. Hill; builders, J. R. Robbins and S. C. Prescott.

Prospect Pl., n s, 320' e Albany Ave., one-st'y brick boiler-house and laundry, tin roof; cost, $5,000; owner, Roman Catholic Orphan Asylum; architect, Wm. Schickel.

Chicago.

BUILDING PERMITS. — H. Fischer, two-st'y dwell., 595 Larrabee St.; cost, $4,000.

Dr. Madison, four-st'y store and dwell., 117 West Madison St.; cost, $10,000.

Le Grand Company, additional story, 430 North Clark St.; cost, $5,000.

Mrs. K. Curtis, two-st'y dwell., 192 North Wood St.; cost, $2,500.

R. B. Smith, three-st'y dwell., 13 Granger St.; cost, $4,000.

Zion Congregation, church, Washington Boulevard and Ogden Ave.; cost, $30,000; architects, Adler & Sullivan; builder, T. O'Shea.

A. E. Kent, three-st'y office building, 12 Sherman St.; cost, $21,000; architect, A. Smith.

S. Hallack, three-st'y flat, 2718 Wabash Ave.; cost, $6,000; architect, C. R. Hickock.

E. Johnson, three-st'y flats, 204 Sedgwick St.; cost, $7,000; architect, G. Otter.

M. Freistadler, three-st'y store and flats, 442 Twelfth St.; cost, $7,500.

J. Carmak, four-st'y store and flat, 116 Ewing St.; cost, $7,500; architect, J. M. Krolrocc.

D. Kennedy, two-st'y flats, 156 Ohio St.; cost, $3,500; architect, M. Folz.

Wm. Rabe, two-st'y dwell., 186 Canalport Ave.; cost, $3,500; builder, F. Koeppe.

Mrs. L. Spafford, two-st'y warehouse, 156 West Monroe St.; cost, $6,000; architect, D. S. Pentecost; builder, G. O'Connell.

H. Koop, four-st'y store and flats, 962 Milwaukee Ave.; cost, $10,000; architects, Schaub & Berlin; builders, Eich & Otto.

E. Whiles, three-st'y flat, 139 Dekoven St.; cost, $5,000.

A. Zatizmann, three-st'y flats, 62 Whiting St.; cost, $5,000.

L. L. Dickman, two-st'y dwell., Idaho St.; cost, $4,000.

C. W. D. R. R. Co., barn, 138 to 146 Throop St.; cost, $5,000.

J. Kundinges, two-st'y store and dwell., 572 Twenty-eighth St; cost, $3,000.

M. Schultz, 3 four-st'y stores and flats, 722 to 724 North Robey St.; cost, $9,000; architect, H. Kley; builders, Rodgers & Koch.

F. Bock, two-st'y dwell., 742 North Hoyne Ave.: cost, $6,000; architect, H. Kley.

E. H. Haines, three-st'y dwell., 14 Astor Pl.; cost, $8,000; architects, Thomas & Rodgers.

Dr. Christie, two-st'y dwell., 873 Twenty-second St.; cost, $4,000.

J. H. Smith, three-st'y store and dwell., 376 Well St.; cost, $8,000.

Cincinnati.

HOTEL ALTERATIONS. — The Burnet House, cor. of Third and Vine Sts., is now undergoing extensive alterations and additions. The improvements embrace a new entrance, new interior marble stairway, dining-room elevators, and additional rooms. The work is in charge of Mr. Frank W. Handy, and will cost about $150,000.

The Gibson House is also being repaired and altered on the inside. A new wrought-iron and marble stairway has been built, and other improvements are being made, which will cost about $30,000; A. C. Nash, architect.

BUILDING PERMITS. — Jno. Shillito & Co., six-st'y brick building, Jackson St.; cost, $30,000.

J. Kamp, three-st'y brick building, Jackson St., bet. Twelfth and Canal Sts.; cost, $4,000.

Jno. Weser, three-st'y brick building, 128 McMicken St.; cost, $4,000.

P. M. J. Kauther, one-st'y frame building, 420 East Third St., cost, $3,000.

Frank M. Hicks, 3 two-st'y frame buildings, Chatham St.; cost, $2,500.

Joe Ocker, addition; cost, $2,500.

Max Burgheim, two-st'y brick building, Ohio Ave., e s; cost, $9,000.

Chas. Ulrich, two-st'y frame building, Euclid Ave., n Corry St.; cost, $2,800.

Hy Batch, double four-st'y brick building, Culvert St.; cost, $8,500.

Dr. Grover, four-st'y brick building, e s Main, near Court St.; cost, $5,000.

George E. Mason, two-st'y frame building, Beech St.; cost, $3,000.

F. Schwarb, two-st'y brick building, Wheeler St., bet. McMillan and Warner Sts.; cost, $7,000.

J. Klein, three-st'y brick building, McMicken Ave., bet. Locust and Main Sts.; cost, $3,000.

H. Stratemeyer, double two-and-one-half-st'y brick building, n s Kline St.; cost, $6,500.

Jno. Van, four-st'y brick building, 614 Vine St.; cost, $8,000.

Repairs and additions costing $8,400.

Total number of permits to date, 286.

Total cost to date, $984,000.

New York.

CATHOLIC CHURCH. — Workmen are laying the foundation for the new Catholic Church of St. Lawrence (Jesuit), at the cor. of Park Ave. and Eighty-fourth St.

HOUSES. — On the s s of Ninety-first St., w of Fourth Ave., 4 three-st'y and basement brown-stone houses, 19' 6" x 65' each, are to be built for Messrs. Foster & Helson, from plans of Messrs. Schwarzmann & Buchmann.

On the s s of Seventy-first St., 425' w of Western Boulevard, 6 three-st'y and basement houses, 16' 8" 52' each, are to be built by Messrs. Fonner and Loutner, at a cost of $70,000, from plans of Messrs. J. C. Cady & Co.

STORES. — For Messrs. Robert and Ogden Goelet, three stores and a storage warehouse are to be built, on the cor. of Broadway and Thirty-eighth St., from plans of Mr. Jos. M. Dunn.

On the s s of One Hundred and Twenty-second St., between Second and Third Aves., a seven-st'y carriage-factory, brick and stone, 60' x 90', is to be built for James H. Butler, at a cost of $65,000, from plans of Mr. Chas. Baxter; and from designs of the same architect a two-st'y iron-railing factory, 35' x 100', is to be built on the n e cor. of One Hundred and Twentieth St. and Sylvan Ave., for Mr. D. C. Carleton.

BUILDING PERMITS. — *Seventy-second St.*, s s 113' e First Ave., 8 five-st'y brown-stone front tenements, tin roofs; cost, each, $15,000; owner, architect and builder, James W. Ramsay, 225 West One Hundred and Twenty-third St.

One Hundred and Twenty-first St., s s, 75' w Third Ave., two-st'y brick workshop, gravel roof; cost, $5,000; owner, David C. Carleton, 208 East One Hundred and Twenty-sixth St.; architect, Chas. Baxter; builder, A. Edwards.

Second Ave., s e cor. Sixty-fourth St., three-st'y brick store and loft, tin roof; cost, $9,000; lessees, Chesebro & Whitman, Seventy-ninth St. and Second Ave.; architect, R. Rosenstock.

Second Ave., n w cor. Eighty-seventh St., 4 five-st'y brick tenements and stores, tin roofs; cost, total, $65,000; owner, Francis S. Schnugg, 433 East Eighty-sixth St.; architect, J. Kastner.

East Eighty-seventh St., No. 242, five-st'y brick tenement, tin roof; cost, $20,000; owner and architect, same as last.

Sixty-eighth St., n s, 175' e Second Ave., 4 three-st'y brown-stone front dwells., tin roofs; cost, each, $10,000; owner, F. Augustus Schermerhorn, 61 University Pl.; architect, H. J. Hardenbergh; builders, John Banta and John L. Hamilton.

West Sixtieth St., No. 509, five-st'y brick flat, tin roof; cost, $19,000; owner, Henry Riehl, 509 West Fifty-ninth St.; architect, R. Rosenstock; builder, not selected.

Tenth Ave., n w cor. One Hundred and Fourth St., 3 five-st'y brick tenements, tin roofs; cost, one $25,000; and two $18,000 each; owner, Franklin Thurston, 62 East One Hundred and Thirty-third St.; architect, Theo. E. Thompson.

One Hundred and Thirty-first St., n s, 225' w Seventh Ave., 8 three-st'y brown-stone front dwells., tin roofs; cost, each, $9,000; owner, Wm. McReynolds, 125 West One Hundred and Thirty-second St.; architect and builder, A. McReynolds.

Audubon Ave., o s, 28' n One Hundred and Sixty-sixth St., three-st'y frame dwell., tin roof; cost, $3,500; owner, Thos. Kearney, One Hundred and Sixty-fifth St. and Tenth Ave.; architect, Will A. O'Hea; builder, A. McNally.

One Hundred and Thirty-first St., n s, 50' w Tenth Ave., two-st'y brick hospital and dispensary, tin roof; cost, $14,000; owner, Manhattan Dispensary, Daniel F. Tiemann, President, One Hundred and Fifty-sixth St. and St. Nicholas Ave.; architect, W. Pray; builder, James Pettit.

One Hundred and Forty-fifth St., n s, 100' e Tenth Ave., four-st'y and basement stone front dwell., tin roof; cost, $11,000; owner, Nathan Hobart, St. Nicholas Ave., cor. One Hundred and Fifty-fourth St.; architect, Theo. Clark; builders, W. G. Slade and A. C. Hoe & Co.

One Hundred and Forty-fifth St., s s, 150' e Willis Ave., two-st'y brick and frame dwell., tin roof; cost, $3,800; owner, Stephen Miller, Willis Ave., near One Hundred and Forty-sixth St.; architect and builder, Wm. Kusche.

One Hundred and Forty-fifth St., s s, 165' w Brook Ave., four-st'y frame tenement, tin roof; cost, $5,500; owners, Jas. and A. Ellis, 301 East One Hundred and Third St.; architect, John F. Wilson.

One Hundred and Forty-fourth St., s s, 424' 7" e Willis Ave., 3 two-st'y brick and frame dwells., tin roofs; cost, $3,300 each; owner, Maria E. Ackerman, 478 Willis Ave.; architect, Chas. Volz.

Ave. B, e s, 22' 11" e Fifteenth St., five-st'y brick tenement and store, tin roof; cost, $12,000; owner, Louis Schwoerer, 206 Ave. A; architect, J. Kastner.

Eldridge St., *No.* 131, five-st'y brick tenement, tin roof; cost, $19,000; owner, Solomon Jacobs, 1195 East Broadway; architect, Henry Herter.

Third St., *No.* 298, five-st'y brick tenement, tin roof; cost, $14,000; owner, John Rheinfrank, exr., 325 East Fourth St.; architect, Wm. Graul.

St. Nicholas Ave., w s, 50′ n One Hundred and Forty-sixth St., three-st'y and basement brick dwell., shingle and tin roof; cost, $11,000; owner, Wm. Thompson, 53 Leonard St.; architect, T. M. Clark.

Clinton Ave., *No.* 430, three-st'y brick dwell., tin roof; cost, $5,500; owner, Gustav Bork, 160 Orchard St.; architect, F. W. Klemt.

East One Hundred and Forty-second St., *No.* 619, three-st'y frame tenement, tin roof; cost, $6,500; owner, Anthony Mead, on premises; architect, A. Arctander.

East One Hundred and Fifty-fourth St., *No.* 581, four-st'y brick tenement, tin roof; cost, $14,000; owner, Frederick Vaupel, 581 East One Hundred and Fifty-fourth St.; architect, Jobst Hoffmann.

Morris Ave., *No.* 674, three-st'y frame tenement, tin roof; cost, $1,000; owner, John Ruddan, 674 Railroad Ave.; architect, C. Abbott French; builder, John J. Barney.

North Third Ave., *No.* 658, four-st'y brick tenement and store, tin roof; cost, $14,000; owner, John Giese, 660 Third Ave.; architect, Adam Munch.

St. Nicholas Ave., e s, 125′ n One Hundred and Forty-fifth St., 2 three-st'y brick dwells., tin roofs; cost, each, $8,000; owner, Wm. Thompson, 53 Leonard St.; architect, E. A. Sargent.

St. Nicholas Ave., e s, 608′ s One Hundred and Forty-fifth St., 2 three-st'y and attic brick dwells., shingle roofs; cost, each, $5,000; owner, Wm. Thompson, 53 Leonard St.; architect, T. M. Clark.

One Hundred and Forty-fourth St., s s, 290′ w Brook Ave., three-st'y frame carriage storehouse; cost, $6,000; owner, James S. Bryant, 715 East One Hundred and Forty-fourth St.

Concord Ave., w s, 150′ n One Hundred and Fifty-sixth St., 3 two-st'y frame dwells., tin roofs; cost, each, $2,500; owner, David Robitzek, Denman Pl., near Concord Ave.; architect, Adolph Pfeiffer.

ALTERATIONS.— *Eighth Ave.*, *No.* 2306, four-st'y brick extension, tin roof; cost, $4,000; owner, Henry Heiner, 2382 Eighth Ave.; architect, F. C. Ridder, Jr.

Philadelphia.

BUILDING PERMITS. — *Lehigh Ave.*, w of Fifth St., 2 two-st'y dwells., 18′ x 32′; Judge & Snyder, contractors.

Birch St., above Salmon St., 2 two-st'y dwells., 20′ x 28′; Judge & Snyder, contractors.

Boynton St., bet. Wakefield and Miller Sts., 4 two-st'y store-houses, 15′ 8″ x 44′; John Rufa, owner.

Federal St., e of Broad St., 2 three-st'y dwells., 18′ x 60′; Jno. Gibson, contractor.

Eighteenth St., above Monument St., 8 two-st'y dwells., 16′ x 54′; D. C. Cleaver, owner.

Walnut St., above Thirty-eighth St., one-st'y stable, 22′ x 55′; R. Hamilton & Son, owners.

Fifth St., above Erie Ave., 4 two-st'y dwells., 12′ x 32′; Sirauk & Dietrich, owners.

Second St., bel. Tioga St., two-st'y dwell., 16′ x 45′; Sirauk & Dietrich, owners.

Cresson St., n of Dawson St., two-st'y dwell., 18′ x 32′; Frank Gillet, contractor.

Germantown Ave., *No.* 2423, addition and alteration, 18′ x 48′; I. R. Stewart, contractor.

Huntingdon St., e of Tulip St., two-st'y dwell., 17′ x 45′; I. R. Stewart, contractor.

Fourth St., s of Huntingdon St., 12 two-st'y dwells., 15′ x 47′; Eldredge & Stewart, owners.

Sixteenth St., n w cor. Wharton St., 10 two-st'y dwells., 16′ x 50′; Thomas Grennan, contractor.

Twenty-first St., bel. Berks St., 13 three-st'y dwells., 16′ x 53′; John L. Carre, owner.

St. Louis.

BUILDING PERMITS. — One hundred and twenty-two permits have been issued since our last report, thirty of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —

Thos. A. Rice, two-st'y brick dwell.; cost, $5,000; Thos. J. Furlong, architect; Mulcahy & Milburn, contractors.

H. C. Hollmann, two-st'y brick dwell.; cost, $5,500 A. Beinke & Co., architects; W. Gahl & Co., contractors.

Mrs. C. Werner, 2 adjacent two-st'y brick dwells.; cost, $3,500; B. Weber & Co., contractor.

H. Wahlkawp, two-st'y brick store and dwell.; $6,000; H. Ellermann, contractor.

Mrs. M. Wright, two-st'y brick dwell.; cost, $7,-000: J. W. Herthel, architect; G. Koch, contractor.

Times Printing Co., four-st'y brick printing establishment; cost, $1,000; I. Taylor, architect; Wickmire, contractor.

Dr. A. H. Meisenbach, three-st'y office and residence; cost, $5,900; Helm Bros., contractors.

A. Wieden, 2 adjacent two-st'y dwells.; cost, $10,-000; A. Wieden, contractor.

S. Cupples Woodenware Co., two-st'y brick stable, cost, $5,500; J. B. Lindsley & Bro., contractor.

T. Manning, 2 two-st'y brick dwells.; cost, $5,000.

S. Wissmann, two-st'y brick dwell.; cost, $3,000; O. P. Koenig, architect; sub-let.

Dr. O. Blank, two-st'y brick store and dwell.; cost, $3,470; F. W. Loffhagen, contractor.

Mrs. Mary Whittier, 4 adjacent two-st'y brick dwells.; cost, $16,000; A. Beinke & Co., architects; C. H. Poertner, contractor.

Francis T. Bryan, three-st'y store and dwell.; cost, $5,800; F. W. Loffhagen, contractor.

John J. Schwartz, two-st'y brick dwell.; cost, $3,-475; A. Wagner, contractor.

Minnie Smith, two-st'y brick warehouse; cost, $3,-500; Geo. Sterringer, contractor.

F. Hood, two-st'y double brick dwell.; cost, $3,000.

Henry Schrader, two-st'y double brick dwell.; cost, $4,000; Beckmuer & Rickman, contractors.

St. Louis Mutual House-Building Co., No. 3, two-st'y brick dwell.; cost, $4,500; E. Mortimer, architect; Remmers & Thompson, contractors.

Wm. Thuener, two-st'y double brick dwell.; cost, $4,400; Geo. S. Nuhaus, contractor.

H. Steuwe, two-st'y double brick dwell.; cost, $6,-000; A. Beinke & Co., architects; H. Hellmann, contractor.

P. Feirney, two-st'y double brick dwell.; cost, $3,-000; Wm. Gains, architect; John J. McMahon, contractor.

Mrs. Kate Cruikshank, 2 adjacent two-st'y brick dwells.; cost, $3,200; P. J. Smith, contractor.

Chas. F. Hotthaus, two-st'y brick dwell.; cost, $3,-000; S. N. Quantl & Sons, contractors.

Chas. Kuhlmann, two-st'y double brick dwell.; cost, $4,350; F. & B. Hartmann, contractors.

John Schopp, two-st'y double brick tenement, cost, $6,000; Kircher & Co., architects; Aug. Fick, contractor.

Fred Hagedorn, 3 adjacent two-st'y brick dwells. cost, $8,000; A. Beinke & Co., architects; Louis Yaeger, contractor.

John Doyle, two-st'y brick dwell.; cost, $3,300; O'Malley Bros., contractors.

Nelson C. Chapman, 3 adjacent two-st'y brick dwells.; cost, $18,000; H. G. Isaacs, architect; Sam Marsden, contractor.

Union Depot Railway Co., one-st'y brick car stable; cost, $4,800; J. C. Brockmuir, contractor.

Miss Mary C. Boyle, three-st'y brick dwell.; cost, $4,000; A. Grable & Weber, architects; Grundewald & Wind, contractors.

Mrs. Cath. Meehan, 2 adjacent two-st'y brick stores and dwells.; cost, $4,500; Jos. Stauder, contractor.

S. Rauner, two-st'y double brick tenement, cost, $4,200; Jos. Stauder, contractor.

John E. Smith, two-st'y brick dwell.; cost, $3,700; O. Doerner, contractor.

C. F. Heidemann, two-st'y brick dwell.; cost, $5,-000; Bothe & Rattemann, contractors.

Fred W. Pedmore, two-st'y double brick dwell.; cost, $2,600; Fred W. Pedmore, contractor.

G. Lessinghaus, three-st'y brick distillery; cost, $14,000; Louis Streeker, contractor.

B. F. Hammett, 3 two-st'y brick dwells.; cost, $9,-900; Kircher & Bro., architects; Chas. Gerhard, contractor.

St. Paul, Minn.

BUILDING PERMITS: — Two-st'y frame double dwell., w s of Pleasant Ave., bet. Walnut and Sherman Sts.; cost, $8,000; owner, Adam Ferick.

Three-st'y brick dwell., w s of Cedar St., bet. Tilton and Iglehart Sts.; cost, $15,000; owner, C. Friend.

Two-st'y brick veneer double dwell., e s of Canada St., bet. Ninth and Tenth Sts.; cost, $8,000; owner, Chas. Weide.

Three-st'y brick block of dwells., e s of Exchange St., bet. Sixth and Seventh Sts.; cost, $35,000; owner, Chas. A. Moore.

Four-st'y brick block stores and offices n s of Seventh St., bet. Cedar and Wabasha Sts.; cost, $30,000; owners, Rogers & Ring.

Two-st'y frame dwell., n s of Summit Ave., bet. Kent and Mackubins Sts.: cost, $8,000; owner, Jas. King.

Two-st'y frame dwell., n s of Dayton Ave., bet. St. Albans and Grotto Sts.; cost, $2,500; owner, W. E. Benton.

Two-st'y frame store and dwell., e s of Bedford St.; bet. Collins and Decatur Sts.; cost, $2,000; owner, H. Strong.

Two-st'y brick dwell., s s of Eleventh St., bet. Cedar and Minnesota Sts.; cost, $2,500; owner, John Schneider.

Three-st'y brick dwell., s s of Ninth St., bet. Franklin and Exchange Sts.; cost, $5,000; owner, Chas. F. Rapp.

Two-st'y frame dwell., s s of Holly Ave., bet. Western and Arundel Sts.; cost, $3,000; owner, James F. Reilly.

Two-st'y brick double store and dwell., w s of Rice, bet. Aurora and University Sts.; cost, $7,639; owner, C. Pottgiesei.

Two-st'y frame dwell., s s of Owasco St., bet. Avon and Victoria Sts.; cost, $2,000; owner, W. L. Merrill.

One-and-one-half-st'y frame dwell., e s of Burr St., bet. Case and Jenks Sts.; cost, $1,800; owner; Oloff Sundgaard.

Two-st'y frame dwell., s s of Owasco St., bet. Avon and Victoria Sts.; cost, $2,200; owner, C. P. Crossfield.

Two-st'y frame dwell., w s of Louis, bet. Iglehart and Marshall Sts.; cost, $3,304; owner, Henry Weber.

Two-st'y brick dwell., s e s of Stewart Ave., bet. Tuscarora St. and Mississippi River; cost, $10,400; owner, Wm. Baturtolzer.

Three-st'y brick stores, n s of West Fourth St., bet. Wabasha and St. Peter Sts.; cost, $12,000; owner, W. F. Davidson.

Two-st'y frame dwell., n s of Summit Ave., bet. Dale and St. Albans Sts.; cost, $8,000; owner, Lillie June Bartlett.

Two-st'y frame dwell., s s of Exchange St., bet. Walnut and Sherman Sts.; cost, $6,500; owner, H. M. Knot.

Two-st'y frame dwell., n s of Yale St., bet. St. Albans and Grotto Sts.; cost, $1,600; builder, S. T. Bennett.

Two-st'y frame dwell., n s of Yale St., bet. St. Albans and Grotto Sts.; cost, $1,600; builder, S. T. Bennett.

2 two-st'y frame dwells., s s of Dayton St., bet. Dale and St. Albans Sts.; cost, $1,800; builder, M. D. Miller.

Two-st'y frame dwell., n e cor. of Dale St. and Selby Ave; cost, $4,600; builder, S. T. Bennett.

Two-st'y frame dwell., e s of Western Ave., bet. Rande and Carroll Sts.; cost, $2,450; owner, J. C. Nelson.

Three-st'y frame dwell.; n s of East Tenth St., bet. Broadway and Pine Sts.; cost, $5,000; owner, Rossanna Lowry.

Two-st'y brick veneer barn, n s of Summit Ave., bet. Rice and St. Peter Sts.; cost, $2,450; owner, John Bell.

Two-st'y frame dwell., n w side of Oak St., bet. South and College Sts; cost, $4,500; owner, Dr. G. Stamm.

Two-st'y frame dwell., s s of Portland Ave., bet. Kent and Mackubin Sts.; cost, $3,500; owner, A. L. Mahler.

Three-st'y brick store and warehouse, e s of St Peter St., bet. Exchange and Tenth Sts.; cost, $7,500; owner, C. L. Horst.

Pump-house, n s of Wood St., bet. Eaton and Clinton Sts.; cost, $2,000; owner, H. Fernstrom.

3 two-st'y frame dwells., n s of Hancock Ave., bet. Prior and Wilder Sts.; cost, $2,000; owner, C. G. Kolff.

Two-st'y frame double dwell., s s of Goodrich St., bet. Western and Donoma Sts.; cost, $2,000; owner, Herman Barfooas.

Two-st'y frame dwell., w s of Josette St., bet. Nelson and Iglehart Sts.; cost, $3,600; owner, Lucius P. Ordway.

Two-st'y frame addition to dwell., s s of Laurel Ave., bet. Western and Arundel Sts.; cost, $2,400; owner, Dr. C. C. Lee.

General Notes.

ROCHESTER, N. Y., — Preparations are making for the immediate erection of a chemical laboratory to be attached to the Rochester University. It will cost $25,000. Prof. Lattimère will supervise the work.

TRENTON, N. J. — The State House Commission has decided to rebuild the burned portion of the Capitol.

WASHINGTON, D. C. — Thirteen hundred new buildings, worth about $1,000,000, were erected in Washington last year.

COMPETITION.

STATE-HOUSE.

[At Denver, Col.]

STATE OF COLORADO,
OFFICE OF THE BOARD OF CAPITOL MANAGERS,
DENVER, April 16, 1885.

In pursuance of an Act of the Fifth General Assembly of the State of Colorado, entitled "An Act to provide for the erection of a State Capitol Building at the City of Denver, and creating a Board of Management and Supervision, and appropriating funds therefor," plans and specifications for a Capitol building which, when erected, shall not cost to exceed one million of dollars, will be received by the Board of Managers **until 12 o'clock meridian, on the tenth day of July, 1885.**

The said Capitol building will be erected upon the summit of a plat of ground in the city of Denver, State of Colorado, known as Capitol Hill, with its principal façade to the west. The length of said building to be about 300′, and no plans will be considered for a building that are over 310′ in length. The breadth, height and general form must be in such proportion to its length as to constitute a symmetrical building, and must be constructed with special regard to strength and durability. The facing and ornamentation of the superstructure, including cornices, pediments and ballustrades, will be of stone.

Drawings must consist of foundation, sub-basement, basement, or first, second or third story plans, roof plans, and section of same, longitudinal section, transverse section, front, rear and end elevations, dome plan, giving section of same and material used, and method of construction from base to summit. Also giving diameter or area of base, style of architecture and extreme elevation.

The said Capitol building shall be built of stone, brick and iron, as far as practicable, and of material found in the State of Colorado, provided the same can be found in said State as cheaply as other materials of like quality in other localities. The entire building must be made as nearly as possible fireproof. The laws of acoustics must be carefully observed. The materials used in said building must be of the best quality. Provision must be made for steam-heating apparatus, and for the drainage, lighting and ventilation of said building in the most approved manner; and such a number of fireproof vaults as may be necessary for the preservation of the books and papers of the various departments of the State Government; also for elevators, water closets, etc.

All plans and scale drawings must be put on wooden frames or stretchers in order that they may be convenient for examination, and on a scale of one-eighth of an inch to one foot.

Compensation for plans and specifications will be as follows: For the best set of plans and specifications the sum of $1,500; for the second, $1,000; for the third, the sum of $800. All plans and specifications for which money is paid shall become the property of the State. The architect whose plans are adopted will be required to furnish the same in duplicate. For the detailed working plans and supervision, the amount shall not exceed two and one-half per cent of the cost of said building. No plan will be adopted until it shall be definitely ascertained that the entire cost of said Capitol building shall not exceed the sum of $1,000,000.

Said building must contain the following rooms, and such other rooms as convenience and symmetry require:

The sub-basement shall be eight feet between joists, and adapted to the use of the machinery, etc., of the building.

The basement story to be not less than fourteen feet between joists, and extend twelve feet above the surface of the surrounding ground. Said basement story to be divided into rooms to be used for the Adjutant-General's quarters, Historical Society, Horticultural Society, State Geologist and Mineral Cabinet, Commissioner and Inspector of Mines, and Storage Rooms.

First, or principal office story, to be not less than twenty feet between joists, and to contain, as near as practicable, the following rooms, to wit:

Three rooms for the Governor.
Same for Secretary of State.
Three rooms for Auditor of State.
Same for State Treasurer.

Two rooms for Insurance Department, two rooms for Attorney-General, three rooms for State Engineer, three rooms for Railroad Commissioner.

Four rooms for State Board of Land Commissioners, three rooms for Superintendent of Public Instruction.

Second, or double story, to be not less than forty-two feet between joists. The Senate Chamber, Hall of House of Representatives, Supreme Court Room and

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CONTENTS.

THE Congress of French architects for the year 1885 is to be held at Paris in June, beginning on the eighth, and closing on the seventeenth. The programme for the meetings has already been sent out, and indicates that several questions of great interest to the profession will be discussed, and perhaps decided, so far as France is concerned, by the action of so influential an organization. In order to give to the consideration of the subjects proposed as much time and thought as possible, a plan has been adopted for the present year which seems worthy of imitation in the deliberations of other bodies of the kind. Instead of assigning certain days for the general discussion of these, among other items of business, to be either hastily decided, or laid on the table, the programme provides that the first business of the first day of the Congress shall be the nomination of committees, each charged with the study, during the week of the sittings of the Congress, of one of the special subjects assigned for consideration. Five days are allowed the committees for deliberation and study, the other members of the Congress occupying themselves meanwhile with other business. At the end of the five days each committee is required to present a report, with such recommendation as to the action of the Congress as it may see fit to propose; and these reports and recommendations will be taken up in order, and adopted or rejected, as the vote of the Congress may turn. This method of treating important general questions, which is really only an adaptation of that employed by legislative bodies, has the advantage of preventing the hasty decisions which so often destroy the value of the deliberations of bodies which meet infrequently and lack experienced leadership. Most of our readers have probably belonged to such bodies, and know how often the members, in the confused state of mind resulting from a tiresome discussion, will pass resolutions which they never really understood or intended, and which, if important enough, have to be subsequently rescinded. These slips do no great harm in church or society meetings, but when they occur in the deliberations of the representative body of a great profession they do more than one might think to discredit and injure the whole profession, and all reasonable precautions against ill-considered action should, on such occasions, be adopted.

THE particular matters which the Congress of French Architects is to discuss this year are nine or ten in number. One of these, the Association for Mutual Defence, is reserved for the consideration of the whole body in the first instance; the others, including questions of public competitions, schedules of charges, public and private sanitation, the property of artists in their works, and the responsibility of architects, are to be studied by committees before they are presented to the Congress, to prevent hasty or meaningless action. The exception in favor of the subject of the Mutual Defence Association is probably made partly on account of the thoroughness with which the plan of the Association has already been discussed, and partly for the sake of interesting as many individual members as possible in the plan. At last accounts, about one hundred and sixty architects had already signed the articles of the Association, and, as it is confidently expected that enough more will join on the occasion of the Congress to complete the full number of three hundred, there seems to be good reason for making the discussion upon its affairs as open and public as possible. As in other countries, the French architectural congress will be enlivened by excursions, the longest of which will be to Rouen, and by visits to various new and old buildings.

SOME experiments, according to the *Builder*, have recently been made in Munich, by Professor Bauschinger, to determine the comparative security of exposed cast and wrought iron columns in case of fire. It is well known to most architects that cast-iron columns are liable to warp and crack when subjected to the heat of a conflagration, particularly if cold water is thrown upon them while they are hot, and precautions against this are now very commonly employed where iron columns are used in building. In New York the law requires that all cast-iron columns which sustain walls shall have an independent exterior casing, to protect them both from the heat of a fire and from water, and a similar regulation, extended to all cast-iron columns used in building, has lately been adopted in Berlin. Columns of wrought-iron, however, which are of course much less brittle than those of cast-iron, are allowed to be used there without protection, and Professor Bauschinger's tests seem to have been made primarily with the intention of obtaining information as to the behavior, under the conditions which exist in a building on fire, of these columns, which, though often used by engineers for supports of bridges, are seldom employed in strictly architectural work. For the purpose of experiment, unprotected columns, both of cast and wrought iron, were loaded with the average weights which they are expected to sustain in actual buildings, and were then heated, first to a temperature of three hundred degrees, then to six hundred, and finally to a red heat, and were then suddenly cooled by a jet of water from a hose. Under these circumstances the cast-iron columns warped and cracked, as was expected, but did not yield entirely, while the wrought columns began to bend before they were heated to redness, and were so violently distorted when cold water was thrown upon them that they could no longer support their load. No doubt the form of the wrought-iron column would determine to some extent its liability to bend when heated, but it is worth remembering that at least in this case they have proved inferior to those of cast-iron, and seem to require protection against fire quite as much as the cheaper kind. The simplest protection, as we may again remind our younger readers, both for cast and wrought columns, consists of a coat of plaster, put on wire-cloth wrapped around the column. If the wire-cloth is held out a little from the iron by wooden furrings, or by corrugations in the cloth, so as to give the plaster a good key everywhere, a perfect and permanent protection is secured at very small expense, and we should not be sorry to have the law require such protection for all columns used in building.

THE *Builder* also quotes from a paper read by Mr. Rymer-Jones before the English Civil and Mechanical Engineers' Society a number of recipes for protecting wood against fire, which deserve to be remembered. Besides the old processes of Burnettizing and Kyanizing, by which the wood is saturated with mineral substances, various superficial applications are made, of greater or less effectiveness. In many of these silicate of soda enters as an ingredient, and a wash of the silicate of soda alone, dissolved in water, is very efficacious in protecting wood against flame. We should be inclined to qualify this by saying that the protection afforded by silicate of soda was apt to be reduced in time by the gradual efflorescing and falling away of the varnish-like coating which it gives; but for temporary purposes it is excellent. Asbestos paint is said by the author of the paper to be nearly as valuable as the silicate solution, and probably clings much longer to the wood. A cheaper application, which seems to depend for its effect on the formation of a coarse silicate of potash and lime in it, is made by grinding together one part of fine sand, two of wood ashes, and three of slaked lime, with oil enough to form a paint, which is laid on with a brush, and adheres well, besides being both fire and water proof. Still another wash, which is coming into extensive use in our own country for shingled roofs, is composed of lime, salt, and fine sand or wood ashes, mixed

with water to the consistency of whitewash. It may be colored with lamp-black or ochre, to take off the glaring whiteness, and forms a very efficient protection against danger from sparks or cinders.

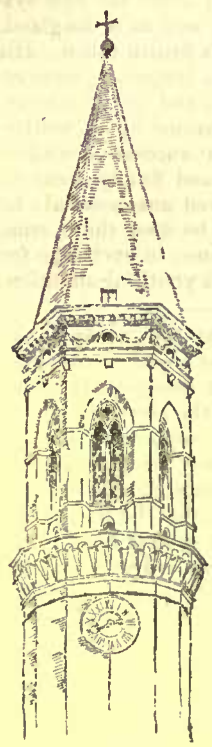
IRON gives a very interesting account of the life of the late Sydney Gilchrist Thomas, the joint inventor, with his cousin, Percy Gilchrist, of the renowned Thomas-Gilchrist process for making cast-iron contaminated with phosphorus into good Bessemer steel by means of a basic lining to the converter. The whole story offers a remarkable example of the literal realization of a boy's dream, as well as of the disappointment which usually accompanies the realization of dreams of material prosperity. Sydney Thomas was born in 1850, and had therefore barely reached his prime at his death last February. He was educated at Dulwich College, intending to study medicine, but the death of his father obliged him, at the age of seventeen, to find a situation in the civil service, in which he wrote and copied all day, and spent his evenings in attending courses of lectures on chemistry and metallurgy, which had a great attraction for him; as well as in acquiring a knowledge of law, which he thought to be necessary to the faithful performance of his official duties. He could not study the metallurgy of iron long without discovering that the greatest obstacle in the way of the success of the Bessemer process lay in the impossibility, with the ordinary appliances, of utilizing for that process the phosphuretted iron obtained from the cheapest and most abundant English ores. Years before, the books on iron manufacture had spoken warmly of the fortune in store for whoever should discover a way of making good wrought-iron and steel from the Cleveland and other similar ores; and the poor young Government clerk made up his mind that he would get that fortune. So completely did this idea take possession of his thoughts that it appeared continually in his conversation, and he often amused himself by calculating how much income a royalty of half a shilling a ton on the three millions of tons of iron produced annually in the Cleveland district would bring him in. As a poor boy in an office, his means for attaining his end were about as limited as they could well be, but he had his evenings for study, and the energy and capacity for improving them, and it was not long before his efforts began to have some result. His cousin, Percy Gilchrist, was chemist in an iron furnace in Wales, and Thomas, after learning everything that he could about what had already been done in the way of de-phosphorizing Cleveland iron, laid out a systematic course of experiments, which he begged his cousin to carry into execution for him. This was done, at a small scale, and the results carefully noted, Thomas himself assisting in the experiments whenever he could get a few days' vacation. Years passed in these trials, but step by step the two friends improved their methods, and in 1877, when Thomas was in his twenty-seventh year, a patent was granted to him for a process for dephosphorizing iron.

UP to this time all the experiments of the cousins had been made on a small scale, but they now felt sure of their ground, and obtained permission to apply their process to a thousand pounds of iron in a Bessemer converter, and later, to five tons at once. More patents were taken out, for improvements in the original process, but their publication fell quite dead upon the scientific world. In 1878, nearly a year after the granting of the first patent, Thomas sat at a meeting of the Iron and Steel Institute, listening to a paper read by a celebrated metallurgist on a process for eliminating phosphorus from iron by melting in a furnace lined with oxide of iron. At the conclusion of the reading, Thomas took part in the discussion of the paper, and mentioned that by his process, applied to quantities of iron varying from six to a thousand pounds, he had succeeded in removing all, or nearly all, the phosphorus from Cleveland iron, as shown by analysis, and fitting it for conversion into Bessemer steel. He was listened to with polite incredulity, and in the summing up of the discussion his remarks were completely ignored; and later, when he offered to read an account of his process before a meeting of the Institute, his paper was put at the very end of the list, and the reading of it was finally postponed altogether. It had, however, been printed, and distributed to members, and produced a great sensation among practical metallurgists in Europe and America; and preparations were made for testing the process on a grand scale. From that time fame and fortune began to flow in upon the cousins; two or three claims of priority made by earlier, but unsuccessful experimenters were honorably adjusted, and immense steel works, managed under the new system, were established on the Continent, as well as in England. Almost at that moment, however, Thomas's health failed. His exertions, and the exposure incident to his frequent journeys, had brought on an affection of the lungs, and his physicians ordered him to a warmer climate. Accompanied by his mother and sister, and a younger brother, he spent successive winters in Australia, India, Algiers and America, and finally went to Paris for treatment. The treatment proved unsuccessful; he grew worse, and his brain gave way, and he died there, completing the sacrifice of life, health and home, in exchange for which he had received the great prize of his youthful ambition.

MR. KEELY, the great inventor, has at last, according to the Philadelphia *Record*, "attained the object of his life." This object was not, it seems, to live comfortably at the expense of the credulous, but "to discover the power which for years he had sought;" and although we supposed that this power had for years been grinding Mr. Keely's coffee for him, and shooting off his little air-guns, on the most familiar terms, we are glad, if he had not done so before, that he has at last secured a good view of the sprite which has so long been working for him. The task seems to have been indeed a difficult one, and we trust that those unbelieving stockholders in Mr. Keely's company who said that the great man spent his time in driving a fast horse which was bought with their money will hang their heads with shame when they hear that he has labored, locked in his workshop, from fourteen to eighteen hours a day, for the past six months, in constructing "a new engine," which is operated on a system entirely different from anything ever used before. One feature of this new system of operation, which will probably appear more important later, is that the original Keely Motor Company will have no part in it, and a new company, with a brand-new capital, and a fresh set of gudgeons for stockholders, is to be formed to carry it into effect. When these preliminaries have been satisfactorily arranged, the "rotary etheric engine," as the new machine is to be called, will "go forth to the world." The power employed in the rotary etheric engine is to be derived, as in the previous machines, from "the interatomic air, or rather luminiferous ether." Considering the luminiferous character of Mr. Keely's agent, there has always been a surprising obscurity about its manifestations, but we are informed that "it is greater in volume by five or six times than gunpowder," and that in a recent experiment a pressure of "twenty-two thousand eight hundred pounds to the square inch" was obtained "in eight seconds." Like the air-gun exhibited at Sandy Hook, the "rotary etheric engine" is to be furnished with "an introductory receptacle," and has also a "liberator," the purpose of which is not apparent. If everything goes well, an exhibition of the new machine is to take place in a few weeks, when an engine "equal to five hundred horse-power" is to be shown. What the stockholders of the old company are to get for their money, beyond an interest in some lumps of old iron, we are not informed, but it is suggested that an arrangement may be made for exchanging the old shares, at a small valuation, for stock in the new corporation.

THE passion for huge cantilever bridges seems to be spreading, and one is now proposed, for crossing the St. Lawrence River at Quebec, which, if it is ever built, will almost rival the Forth bridge itself in dimensions. The widest span of the Forth bridge is, if we recollect rightly, to be seventeen hundred and ten feet, but there is to be a second span only ten feet less in width, while the Quebec bridge will have only one wide span, of about fifteen hundred and forty feet, and two short shore ends. In profile, the Quebec bridge is to be very similar to its Scottish type, although the trussing is somewhat simpler, but the horizontal wind-bracing, which in the Forth bridge is secured by considerable lateral extension of the construction, is managed at Quebec by placing the two great systems of parallel trusses about seventy feet apart, and carrying the two tracks of the railway which crosses the bridge directly through the trusses, penetrating the network of uprights and cross braces as a knitting needle threads its way through the loops of a stocking. The lower chords of the trusses serving thus to carry the roadways, nothing is needed between them but the rods or eye-bars of the lateral bracing, which can be applied with great effectiveness and economy under such circumstances.

PERUGIA.


San Pietro, Perugia.

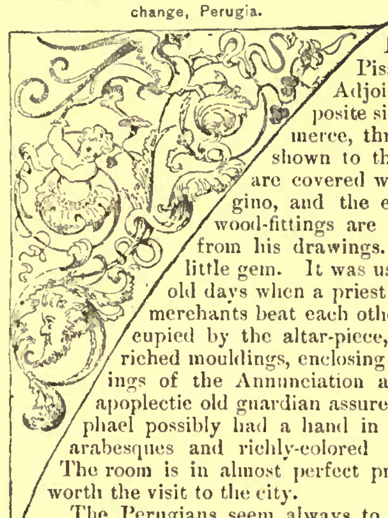
IN journeying about Italy one is constantly brought face to face with the past. Hardly anything the modern state has accomplished is ever considered as worthy of more than passing attention, but the student or tourist is continually called upon to admire what was produced by men who lived and worked centuries ago; and, especially in central Italy, one is apt to become exceedingly tired of looking backward and straining to bring one's self into sympathy with what is away and removed from our nineteenth-century wants and expectations. The boast of the modern Italian is in what his forefathers did. For himself he is content to remain placidly in the halo of what he fondly calls his own art, while Anglo-Saxons and Gauls overrun the land and gorge themselves to indigestion with old masters, and look upon Italy merely as a great art-school, kindly preserved for their especial benefit and taken care of by the art-less modern Italians. And after a long stay in Rome, where one is sure to contract a stiff neck, from trying to compass in his vision all the dead Roman, early Christian and Renaissance art, or a visit to a few sleepy-eyed, provincial towns like Viterbo, it is quite refreshing to find in Perugia an old city which one can easily appreciate: a place where the antiquity seems to reach down to 1885, so that no mental straining is required to glance back along the line to old master Pietro Perugino, the father of so much greatness, or even farther back, into the days of the Etruscans and the rock-cut tombs. Elsewhere there is nearly always a questioning gap at some point in the art-history; a falling empire or an invading barbarian horde having upset everything, and mixed styles and dates in such hopeless confusion, we never venture to explore too closely. But in this old Umbrian capital the ages and the invaders have dealt kindly with all the arts, and the city can fairly be said to present its mediævalism to the modern architectural student under very much the same aspect it appeared to Benedetto Bonfigli, four centuries ago, when he drew those pictures in the Pinacoteca which show some portions of the town so very much resembling the modern Perugia that one is almost tempted to believe some skilful patcher has been at work on the old frescoes, and compelled antiquity and the nineteenth century to agree.

For some occult reason which is often questioned but never fairly expounded, Italian railways always carefully avoid the city at which they may be aiming. Consequently, after a ride across the rich Umbrian plain, and a cut through the mound where the old Etruscan dead are still assumed to be reposing, the traveller finds himself not at Perugia, but at the base of a high hill, on top of which lies the city, full three miles distant by the road, spreading over the irregular summit, extending to the right across a long spur, and reaching part way down into the valley. It is a stronghold, a city set on a hill, and though the traveller may be disposed to grumble at the railroad which would not climb the height for him, after he has reached the top and stands on the terrace, full thirteen hundred feet above the winding Tiber, he will forget everything but the glory of the magnificent prospect before him: the great broad valley dotted with villages and rising grandly on either side to the hills, now capped by an early April snow; Assisi, perched saddlewise on the spur of a near mountain at the left; Foligno, towards the end of the long, fine line which marks the railroad; and perhaps even a glitter from one of the towers of Spoleto. And then, if our traveller is an architect, he will turn and walk down the length of the Corso — the only level street in the place, and short at that — and take his stand on the steps of the gaunt, naked cathedral, face to face with the Palazzo Publico. A fine structure it is, this old town-hall, with its high, irregular balcony on the front, where proclamations were wont to be made and criminals' heads exposed to scorn, and its boldly-designed side portal, rich with twisted shafts, sharply-cut leaf-work, and emphatic mouldings, above which, on each side, a lion springs savagely from an abrupt corbel. There are not many details about the building; a few good windows, an effective cornice, and a little delicate work set against the rude stonework at the lower belt-course; but everything counts and helps out the dignified effect of the whole in a manner which a photograph only partly expresses; an effect which is greatly enhanced by the rich, dark color of the old masonry — *bona fide* stone-work, too; not the stucco which makes so many Italian buildings take well in a photograph. The palace was erected towards the close of the thirteenth century, a period when Perugia was a proud city and strong enough to hold her own against the restless Tuscan republics which at that time were so continually wrangling with each other and all their neighbors. Over the principal entrance are figures of a griffin and a wolf, representing respectively Perugia and Siena, while the vanquished expression of the latter animal, and the heavy chains and gate-bolts suspended at another door, are the tokens of the victory won over Siena in 1358. The palace is one of the comparatively few good examples of civic Gothic architecture existing in central Italy, and is worthy of most thoughtful study.

In the upper story of the palace is a long, rambling picture-gallery, stored with paintings gathered chiefly from the suppressed monasteries and convents of the surrounding country. A few days ago I met an architect who declared he did not care a straw for paintings, and deliberately proposed to skip all the old masters. Perhaps he was right. Such a course saves considerable bother and spares one any doubt or conjecture about this Pinturicchio or that Le Spagna. But, somehow, if the chief end of a visit to Italy be really to gain a keener and more sensitive art-taste, the old pre-Raphaelites cannot be wholly ignored. And though contemplating the quiet sweetness of some of the Fra Angelicos such as are in this gallery may not help one a whit toward preparing specifications for a $1,500-stable, or making details of a front staircase, it will surely lead the way to a truer appreciation of some of the delicate architectural results achieved by the old master-builders, whose inspirations were perhaps as pure, if in a different line, as those of da Fiesole. The gallery contains an interesting succession illustrating the whole history of Umbrian painting, including several of Perugino's best works, and a few even ascribed to Raphael.

Immediately in front of the Palazzo is the Fonte Maggiore, one of the finest fountains of its kind in Italy, a great polygonal basin set up on a few steps, with an inner basin borne by a small forest of diminutive columns. The fountain is ascribed to the Pisanos and Arnolfo del Cambio. Adjoining the Palazzo on the opposite side is the old Chamber of Commerce, three rooms only of which are shown to the public. In one the walls are covered with fading frescoes by Perugino, and the elaborately-carved and inlaid wood-fittings are said to have been executed from his drawings. The adjoining room is a little gem. It was used as a chapel in those good old days when a priest even was needed to help the merchants beat each other at trade. One side is occupied by the altar-piece, all aglow with gold and enriched mouldings, enclosing three fine, warm-toned paintings of the Annunciation and the Baptism, which the apoplectic old guardian assured us were by Perugino. Raphael possibly had a hand in the decoration of the vault arabesques and richly-colored frescoes on a gold ground. The room is in almost perfect preservation, and alone is well worth the visit to the city.

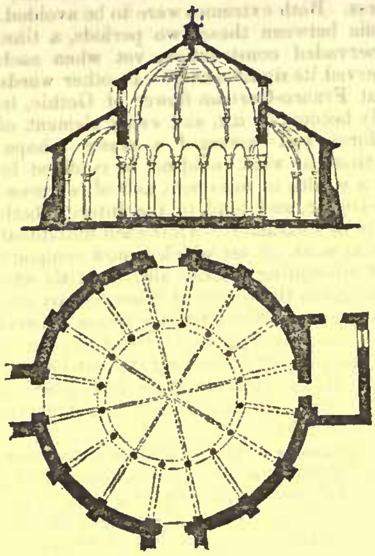
Vault Decoration, from the Chapel of the Exchange, Perugia.



The Perugians seem always to have had a decided taste for color, and to have indulged it pretty freely when a good opportunity presented itself. Turning out of the Corso, passing under the clock of the Palazzo Publico, and descending a street full of mediæval reminders and quaint nooks, one comes to a little green, opposite which is the oratory of San Bernardino, with a small façade, every inch of which is covered with bright color. The scheme is quite simple: a central doorway, two rows of side niches, and across the whole a cornice and pedimented gable; but the soft yellow tone of the once white marble, the deep-red of the terra-cotta plaques and arch ornaments, the pale blue grounds to set off the statuettes, and the occasional bits of colored marbles and mosaics, combine to render the front an exceedingly interesting piece of polychromatic work. It does not take a great deal nor a great variety of color to produce a good effect, and yet how hard it seems now-a-days to combine architecture and decoration as successfully as we find them united in this case. There is just the right yellow to give depth to the blue — always a difficult combination — and the few touches of gold about the angels' heads over the niches and around the arch are just enough to brighten the ochre tones and intensify the terra-cotta red. And if memory serves me rightly, the door adds another note to the harmony, being painted a dull green, a homely color in itself, but toned aright by time and the storms. Perhaps this façade was not as entirely harmonious when it was fresh and new. A restorer has been working at it lately, cleaning the marble and brightening some of the colors. His work thus far does not promise very happily, but as it stands now the oratory presents surely a most pleasingly soft and mellow effect.

At the end of the spur of the city which stretches out toward Assisi is the old monastery and church of San Pietro de' Casinensi. The church is of the basilican type, with a richly-gilded flat ceiling and a double row of antique columns, stolen from somewhere and rearranged for the church with the easy adaptability which characterizes so many of the edifices of this description. Outside, in the court-yard, is the church-tower, rising nobly above the monastery roofs, a simple but rather interesting mixture of Gothic feeling with half-understood Classic forms. Diagonally across the city, at the other extremity, is the little church of San Angelo, a circular edifice somewhat on the plan of San Stefano, at Rome. Since the time of Constantine the Italians have never been really good constructors, but occasionally one comes across a clever bit of construction such as this, which though Italian, strongly suggests a northern origin. The central portion of the church is about twenty-seven feet in diameter, around which is an aisle less than twelve feet wide. Separating the two are arranged sixteen antique columns, bearing a series of arches

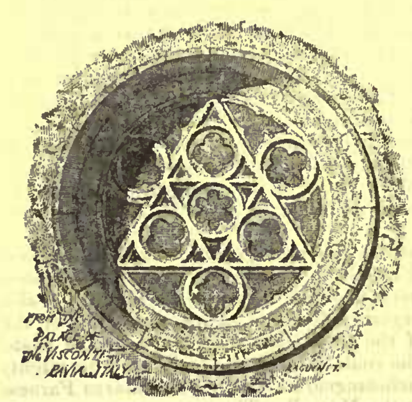
and a clerestory wall. But instead of covering the central space with a masonry dome, which they probably did not dare to construct, or a flat roof, which they did not want, the builders threw light, brick arch ribs across from over each alternate column. On these were placed the horizontal purlins directly bearing a light wooden roof-covering. The aisle was treated on the same principle, by turning half rib-arches against the spring of the central ribs. The strains were thus carried from the centre to the outer wall, and thence to the ground by aid of wide buttresses. And finally, fearing, perhaps, an inequality of load on the central ribs, a brick drum was built up over the intersection, for a counterpoise. As it stands now, the construction does not present a very elegant appearance, but it is light and strong, besides being easily built, and the idea is surely a good one, capable of being adapted to produce a very pleasing interior effect.


San Angelo, Perugia.

Just north of the cathedral is a long fragment of the old Etruscan or Roman wall, with a fine, arched gateway, locally known as the Arco di Augusto, a great, massive structure, just such as one reads about in Bunyan's "*Holy War*," or Froissart's "*Tales of the Crusaders*," with battered walls full twenty feet through, and a wide-springing arch. Above is a row of stunted pilasters and a few half-closed peep-holes, while on top of one of the projecting battlements is a pretty Renaissance loggia, added since the city has passed by the old barriers. It makes an interesting picture, with the little glimpse of the steep road leading in through it, and a lofty tower rising from somewhere away above and beyond it. Perugia abounds in such picturesque bits and unexpected combinations, and a week soon slips away while one is rambling about the old town, picking up an idea here or a suggestion there, and filling one's sketch-book with fragments of quaint antiquity. C. H. Blackall.

HEINRICH, FREIHERR VON FERSTEL.[1]

(1828–1883.)



MORE than a year has passed since a cruel death removed our never-to-be-forgotten friend and colleague, while yet in the prime of life, from the scenes where his great activity and creative power had achieved so much. Even after this lapse of time, it seems to us as if that which had happened so suddenly and unexpectedly could not be true; as if that amiable man, so untiring in his labor, must still be among us. And indeed it is a rare thing that the phrase "an irreparable loss," which we lightly use so often, has so deep and lasting a meaning as in this case.

As yet no one has been found to take the place of him who is gone, either as teacher or in the numerous scenes of his public activity, in his professional intercourse or in society. How, indeed, can we ever hope to replace completely any artist possessing such versatility and such harmony of endowment and culture? For we may mention at once that these constituted the great importance of Ferstel's personality. Many of his Viennese colleagues are of equal rank, and are equally honored, each as the representative of a certain artistic tendency, to which he holds fast, and which he defends by word and deed, as though it were a confession of faith. Ferstel, on the contrary, in all that he did and thought, took the freest and broadest view of his profession as an artist. Like Leo Battista Alberti, he did not look upon architecture merely as a limited branch of art, to be followed as a trade. He regarded architectonics — to use the Hellenic term — as the *Erztektonik*, the guido of all other arts, the power which regulated life. Not only in temples and palaces should architecture be the expression of man's dignity and intelligence, but in all the forms and the surroundings of his daily life. In every direction, as far as his sphere of activity reaches, should the influence of architecture also extend, bringing with it order, proportion and beauty.

Such a broad and lofty conception of architecture could not have been formed, and could not have expressed itself, anywhere but in


Heinrich, Freiherr von Ferstel.

the soil of a capital city. The immense changes that have transformed Vienna during the last ten years have left it the most beautiful modern town in Europe, and among the many great talents which strove to carry off the palm, they called forth an artist in whom the nature of a man of the world was blended with the peculiar individuality of a Viennese. In this respect Eitelberger is quite right, when, in his essay on Van der Nüll and Sicardsburg, he calls Ferstel "the most remarkable architect whom the Viennese school has produced."

It is peculiarly interesting to compare Ferstel as an artist with the most remarkable modern architect of North Germany, Gottfried Semper. Much sympathy existed between these two men, and Ferstel, in his lectures, frequently adopted Semper's arguments. In his opening speech as Director, in 1880, he ranks him with Schinkel as leading the new school of architecture, and it is certain that he was himself considerably influenced by him. In Semper we also find the unmistakable stamp of a man born in a large city; but it was the spirit of a commercial town which animated him (he was born in Altona, at the gates of Hamburg), a spirit ever gazing longingly into the far distance. And this it was that caused him to leave his home for Paris, and led him to the south, to Dresden, to England, to Switzerland, and at length to Rome, the home of all his ideals. Here the tireless wanderer found an eternal rest at the foot of the Pyramid of Cestius. The North German master was constantly occupied, not only with his practical work but with theoretical work as well, with historical research and with the preparation of his book on Style, which is a marvelous fabric of philosophic art-knowledge, set forth in individual and pregnant language. Ferstel, on the other hand, we see growing up and taking firm root in his native soil, and, as a true child of Vienna, turning all the rich treasures of his heart and brain into forms of grace and loveliness, into noble ornaments to decorate his native town. This marked natural trait, mobile freshness and gay amiability, displayed even when his mood was serious and full of sentiment, cannot be too strongly insisted upon in characterizing Ferstel. It is a trait which gives him a close spiritual likeness to Schubert and Grillparzer, and is synonymous with the real Viennese spirit in the best sense of the word.

Ferstel did not compete directly with regard to the plan for enlarging Vienna, being prevented by his work on the Votivkirche and on the Bank; but he penetrated at once to the heart of the great task, in one of those clever little literary works, several of which, devoted to the vital subject of Vienna's improvement, we possess. I mean the pamphlet he published in 1860, in collaboration with Eitelberger, on the "*Dwelling-House*," in which he declares war against our great speculative barracks, and, in pleading for the erection of true homes, gives us reasons which are well worthy of being taken to heart. His suggestions met with approval from the public, and were widely discussed by the profession; but, as Ferstel's fellow-worker expresses himself, "The Board for the improvement of the town laid them respectfully aside," and even to this day the words hold good that "the question still remains unanswered, how one can in Vienna build

[1] A memorial address by Carl von Lützow. Translated from the *Zeitschrift für Bildende Kunst*, by F. J. Ancketill.

well, cheaply, and in a manner suited to the people." Ferstel, as we know, did not allow himself to be discouraged by the difficulties and obstacles he met with; that which he did not achieve at the first attempt he did achieve at the second, in the founding of the Cottage Quarter by Währing, for we must look upon Ferstel as the real originator of this work. The artist did not desire merely to create a group of pattern buildings which were to realize his ideal of a dwelling-house; he wished at the same time to give an example of how a stop might be put to the wild architectural practice then in vogue in the suburbs of Vienna. We find Ferstel's ideas on this subject — one of the most important as regards the further improvement of the town — in a memoir on a general building-plan for Vienna, which was published in 1877, by the Austrian Society of Engineers and Architects. In this work he says: "The outskirts and suburbs of our town have been extended in a manner which, as regards want of plan and absence of taste, far exceeds anything yet produced, either in our country or elsewhere. A visit to most of the principal towns in Germany, France and England shows that wherever space could be procured in the circumference of the original old-town, the finest quarters have sprung up; also that all conditions of comfort and health have been considered more than would be at all possible in the more densely peopled portions of the city."

Only a short time before his last illness, Ferstel took part in a new creation in connection with these ideas: the laying out of the park on the Türkenschanze. This plan is the last which we have from his hand. The site, one which commands the most beautiful view in the immediate vicinity of the town, had long lain waste and had, two hundred years ago, been wrested from the Turk by the German sword. Here Ferstel also wished to erect a memorial of the freedom of the city. But especially he looked with prophetic eye at a picture to be realized in future ages — the picture of the city striving for air and light, and stretching out her arms to the mountains.

Let us place ourselves in imagination on those heights, and look down upon Vienna with its sea of houses spread out before us, its towers and domes so manifold in their forms of spires and vaults. Then we understand that, with a nature so rich and so filled with the ardent desire to create as was Ferstel's, with a heart so appreciative of progress in all things, of existence and of beauty as was his, it was impossible for him to be a severe respecter of styles. The opinion he expressed in the lecture already cited as to what should be the architectural education of to-day, holds good, also, in all essentials with regard to current architectural practice as he understood it. He says: "It allows the individuality of each to develop freely; it is not dogmatic, but historical." And he adds: "As men's works combine to form their history, thus architecture will appear as a chronicle of the world in stone." Ferstel himself had explored in thought many centuries of this chronicle, and awoke its spirit to new life in his creations.

His youth was spent amid the "storm and stress" of the revolutionary period of 1848. Both the bureaucratic tutelage of official architecture and the autocracy of that academic antique, which had degenerated into a mere bloodless phantom, now received their death-blow. Mediæval, and especially Gothic art, supported by the revived national sentiment of Germany, made its way not only into the study of the scholar, but into the workshop of the architect. Georg Müller had taken the lead in this movement, by erecting, in the spirit of the Italian Romanesque style, the beautiful Alt-Lerchenfelder Church. And when there was a competition for the building of the Votivkirche — open competitions for public works dating, by the way, from that time — none but the Gothic style could be chosen. This was the universal conviction alike of the artists and laymen, at their head standing the young Archduke Ferdinand Max, who, as protector of the whole undertaking, gives vent rapturously to his views on this subject, in his first appeal, dated February 23, 1853. Apart from the inner necessity which caused the age to choose inevitably the Gothic style, a great artistic and technical advantage for Viennese architecture lay in the necessity that the structure should be a logically developed work in *stone*. For more than a hundred years before the foundation of the Votivkirche, no really monumental building entirely wrought of stone had been erected in Vienna. The finest building materials, offered in abundance by the country round Vienna (the limestone of Brunn and the lime and sand stones of the Leitha, etc.) had lain unused or had been lost under miserable plasterings. And any one who compares the Vienna of to-day with the Vienna of that time, cannot but remark with satisfaction the great progress we have made.

With stone architecture, the technique of masonry with its practical school, the *Bauhütte* (fraternity of building masons) found their entrance into Vienna. It is a well-known fact, often referred to with gratitude by Ferstel himself, that no one deserves more credit in connection with this important part of modern Viennese architecture than Joseph Kranner, for many years director of the *Bauhütte*, for the building of the Votivkirche. Ferstel's own words on the subject are as follows: "In his admirable practice, which reminded one forcibly of a mediæval master, I stood beside him at first merely as a willing pupil." Our artist here refers to *constructive* problems, to the organization of the Bauhütte, to the choice of materials, etc. As far as the *artistic* portion of his task was concerned, Ferstel had perfectly understood himself, even in his early youth. At the request of the Assembly of German architects, in 1865, he gave in very decided language his reasons for the choice and the treatment of the style adopted in the Votivkirche; it was a positive necessity for him to defend, in an intellectual manner, the course he had taken. He said in effect that he could decide neither upon the early Gothic nor upon the style of the latest Gothic period. In the former the constructive system had but just declared itself as such, while in the latter it had degenerated into a "decorative scheme," and had lost itself in lawlessness. Both extremes were to be avoided. "I decided on the art of a time between these two periods, a time when style had thoroughly pervaded construction, yet when each constructive element still preserved its significance." In other words he decided on the style of that Franco-German flower of Gothic, in which construction had wholly become *an art*, and every element of the building's spiritualized form had assumed a plastic shape. Hence his further conviction that the work could not be confined to the structure proper, but that a wealth of ornament and of representative art must adorn the exterior, and lend to the interior both charm of color and spirituality of character. Thus each individual part combined to form that great work of art which is now complete before us. I dare not think of attempting to name all the artists who worked at this shrine, which contains the jewels of Viennese art and industry. Führich, the greatest ecclesiastical painter whom Austria has produced, is at their head, and hardly one of those able men whom Vienna has to thank for the present flourishing state of her art-industry is missing from their ranks. During these long years of serious and successful effort they have all looked up to the departed master as to their leader and their guide.

In the bank already briefly mentioned, which was built between the years 1856–60, Ferstel had already shown his delicate feeling for decoration, and had proved the truth of the law, that only in association with its sister arts, not in cold isolation, can architecture hope to attain its aim. The most favorable opportunity for realizing his ideal was offered him in the construction of the Austrian Museum, the very founding of which had been due to similar convictions. It was begun in 1868 and finished in 1871.

In the features of the Bank we note already a trace of Southern art — of the influence of Orcagna, combined with the views of our native Romanticists. During the building of the Archduke Ludwig Victor's palace, which took place between the years 1863–66, the change in our artist's views was completed; his Gothic period lay behind him. In the creation of the Austrian Museum, Ferstel proved himself a perfect master of the Italian Renaissance. The colonade of this museum is perhaps the most beautiful design in this style of which modern architecture can boast, and it is, in my opinion, without doubt the noblest and most charming of Ferstel's work. The main idea of the plan — the direct connection along the main axis of the building, of vestibule, court and staircase — had been inspired by the palaces of Genoa, the chief beauty of which, as is well known, lies in the construction of such vestibules and stairways. But the treatment of the motive, the way in which the central portion is connected with the wings, away that for clearness of effect and for compactness could hardly be imagined better, and, finally, the artistic development and adornment of the adjoining apartments, and especially of the great colonnaded court — all these bear so legibly the stamp of Ferstel's individuality that they may serve as a model of the manner in which a modern artist should bear himself in presence of the legacy of his predecessors; learning from them and yet using his own creative powers. The style of the arcaded court breathes the spirit of the early Tuscan Renaissance; and from the vaults of the light two-story columned halls the delicate grotesques look down upon us with those fantastic figures which Raphael and Giovanni da Udine called to life from the baths of the ancients and made the good genii of a decorative art as attractive as it is free from empty pomp and show.

We see this fresh, youthful Renaissance style reaching a masculine and noble beauty in Ferstel's University, the last and grandest creation in secular architecture which he bequeathed to us. Palladio's and Scamozzi's designs guided him in his conception of the exterior. For the plan of the great court there was only one model in accordance with which he could arrange the features of his mighty men — Sangallo's and Michelangelo's Court of the Palazzo Farnese in Rome and its prototype the Marcellus Theatre.

He who knew Ferstel and saw him engaged during years of ceaseless study, in striving toward his lofty goal, can understand the great difficulty of meeting the needs of a modern institute of learning, while at the same time drawing correct artistic inferences from the history of the past with regard to the aspect which the work in its entirety should assume. What he offers us in the finished building rises again far above the mediocrity of borrowed beauty and attains to a quite peculiar expression of his individuality. To the serious fundamental tone of the Roman Renaissance he added an accent of grace which was native to himself, and there is also often something to remind us of the delicate work of the Viennese artists of the last century, but always without the least degeneration into *baroque* details. And over the whole there broods a spirit of purity and nobility such as should pervade a home of knowledge. In the interior arrangement of the Austrian Museum Ferstel had already shown his talent for creating beauty with proportions great in scale. The superb staircases and broad-vaulted halls of the University are his masterpieces in this direction, and place him on a level with the greatest architects of the past in all that concerns the art of composition. The task of adding to these noble halls that profusion of pictorial decoration which Ferstel intended them to receive, is reserved for his successors, and we may hope and expect that no one

will hinder or limit them in the performance of the duties bequeathed them. We envy our young men the possession of such rooms for study, the mere aspect of which should ennoble their spirits and turn their minds toward a lofty aim.

In finishing the interior of the University Ferstel took the opportunity to prove his power in a department where he had already more than once distinguished himself — I mean in brick construction. His Chemical Laboratory and the Austrian Museum, together with the School of Art adjoining it, are among the most successful modern works in this material, to the simple beauty of which our eyes have but recently been opened. In the University the lateral courts are carried out in brick. Ferstel understood, as did no one else, how to give the hard, inflexible material life and charm, either by the rhythm of his masses or by the assistance of decorative painting, glazed terra-cotta, *sgraffitto* work, etc. Not only in stone, but also in brick construction was he a reformer.

How could one conceive of an activity which at every step shows the artist united to the student, imagination joined to reason, except as based upon the most comprehensive culture? A glance at Ferstel's life shows with what care he strove to educate himself in all technical and scientific branches. His studies at the Technical High School of Vienna were followed by an academic period, during which the young artist not only worked in his own branch at the School of Architecture under Van der Nüll, Siccardsburg and Rössner, but also, between 1845–48, profited by the teaching of Kupelwieser and Ender in the night classes of the School of Painting, and practised drawing from the antique and from life. Ferstel's Italian sketch-books — numerous leaves of which were shown at the exhibition of his works in the Austrian Museum — reveal the fruits of these studies, and bear witness especially to his lively feeling for landscape beauty, while at the same time we recognize that the eye of an architect had dictated the choice of motive and guided its rendering. During his academic years Ferstel also followed at the University certain courses which seemed to him important. How many-sided was his knowledge in every department with regard to the practice of art and of art-industry, how profound his acquaintance with the art of the past, especially with painting and engraving, all can recognize who were among his friends and who know the valuable collections of pictures and engravings with which, particularly in later years, he occupied his leisure hours.

I have already mentioned his relation to Joseph Kranner — a bond of friendship which caused the younger artist voluntarily to accept the position of an aid to the elder. The sympathy between them resuscitates, as it were, a bit of the old guild life of the Middle Ages, and in Ferstel's own life we have much that is analogous with those family ties of olden times, when the talents of the father or uncle were often inherited by the children, and when relations of the same generation helped and advised one another. While still very young (1851–53) Ferstel received support of this kind from his uncle, Friedrich Stache, the founder of the *Künstler Haus* in Vienna. The numerous plans for building and restorations ordered by the Princes Lobkowitz and Kinsky, the Counts Claue-Gallas, Nostitz and others, which were being worked at in Stache's office, gave his nephew an early opportunity of occupying himself with practical work, and hastened the development of his great talent, which Stache soon recognized and all his life tried to cultivate and assist. A second and very similar bond of sympathy, and an invaluable one for Ferstel, was his long association with his brother-in-law, Charles Köchlin, who in 1856 was his assistant in the construction of the Bank, and who after 1872 was always at his side. During Ferstel's last few years especially, Köchlin shared with him the great responsibility of the University building, which he is at present finishing alone.

In all the relationships of life we find the master preserving the fundamental qualities of his character — gratitude and devotion to true merit, regard for the most delicate social forms, without any loss of the dignity which his remarkable talents justified. In his intercourse with his scholars he was kind, but strictly conscientious, and had the power of inspiring them with enthusiasm for their noble profession. From their ranks was formed a staff of young architects and teachers who, at Ferstel's side and under his intellectual guidance, helped to produce the flowering of Viennese architecture. We may count upon them as the heirs of his artistic views and the true followers of his doctrines.

It was sometimes thought strange that Ferstel, occupied with teaching, taking a lively interest in public life, and in the management of innumerable institutions and societies, should still continually take part in new architectural undertakings and competitions — as, for instance, in the competition for the Lloyd buildings in Trieste, in which he gained the prize, and last year in the competition for the Parliament House in Berlin. But it is just this unquenchable creative impulse which in my eyes characterizes Ferstel's as a God-given talent, for, to use Otfried Müller's classic words: — "It is the constant desire to *create* which alone makes an artist!"

If, in conclusion, we ask ourselves what position our master fills in a general history of Art, and more particularly that of our own time, we may mark two qualities as his especial characteristics — his profound scholarship and his *modernité* of spirit. The former gave him a deep knowledge of the noble traditions of the ancients, while the latter kept him in continual and lively intercourse with the world about him, enabled him to feel with sympathy all contemporary things, and inspired him with the free unprejudiced spirit which he manifested in the most diverse situations of life. In To-day he saw the continuation of that youthful period of the modern mind which in the fifteenth century passed from Italy to the rest of the world. To quote his own words: — "The discoveries and the diffusion of the positive sciences and their influence in all the circumstances of life increase daily. All industry and trade receive a new impulse from science, that lamp which illumines our century. In all that concerns social questions the world is slowly but surely becoming wiser and especially more humane." The whole individuality of our friend was the expression of these confident and hopeful views, and his works bear witness to them in the noblest way.

See how outside the Schottenthor his Gothic church now stands, surrounded by a group of dwelling-houses and monumental structures, varied in form and style, but all infused with the same artistic individuality, and arranged upon an harmonious plan with their charming gardens about them — a coherent artistic creation of Ferstel's. It is no showy palace which has been conjured out of the desert by autocratic caprice, like the palaces and parks of the last century. It is a creation of a distinctly ideal stamp — placed in the centre of the crowded capital, and yet marked by the consecrating impress of genuine art. And a particularly strong evidence of the change that has come to pass is afforded by the fact that there is room *for the artist himself* in his creation. He no longer disappears in the dust of the workshop, nor does he need to hide from the powdered scorn of courtiers. In the very heart of the quarter stands his own dwelling, the home of a blooming family, watched over by a noble wife — an artistic home, without pomp or show, but the worthy abode of kindness and sociability.

Verily our friend was right when he gazed with so confident an eye on the march of time. And we, who have been and are the living witnesses of all the noble and beautiful creations with which our time has adorned our city and the Fatherland, must not lose hope and confidence in the future because of the blow we received by Ferstel's death. That which the great master accomplished by constant effort and conflict forms our pride and joy, encourages emulation in our young artists, and will be a glory to Austria through all the coming centuries.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

COMPETITIVE DESIGN FOR STABLE NEAR ST. PAUL, MINN., BY "*Hope.*"

FOUNDATIONS.—Build a dry wall under the stable portion 1′ 6″ thick, of good stone and high enough to make a cellar 6′ 6″ in the clear; the rest to be a trench wall and built deep enough to go below frost. All stone to be faced and pointed on the outside above grade. Do all digging and grading. Build a chimney of good hard-burned brick. *Framing.* — All framing to be of good sound spruce, braced and pinned. *Boarding.* — All roof and wall boards to be of good sound hemlock; also, under floor-boards of first and second stories. Upper floor-boards to be of sound spruce in both stories.

Outside Finish.—The outside finish to be good pine or white-wood, including gutters, conductors, brackets, etc. Build a ventilator on roof; sawed cedar shingles. Build both inclines of spruce; selected spruce clapboards. *Windows and Doors.* — Window-frames to be sound pine with hard-pine pulley-stile. Window-frames to be of pine 1½″ thick and glazed with first quality single-thick German glass. Door-frames to be of pine. Doors on the inside will be mill doors, 1½″ thick, except sliding doors, which will be sheathed. Outside doors will be sheathed with pine.

Inside Finish. — Walls and ceilings of carriage, man's, and harness rooms, horse and cow stables will be sheathed with best spruce sheathing. Build ventilation-shafts and connect with ventilator on roof. Build washing platform with a gutter. Fit up a water-closet under stairs. Build a flight of stairs. Fit up harness-room with a sink, harness-case with glass doors, and a pole on iron brackets. Fit up horse stalls with wooden mangers and iron hay-racks; build stanchions for cows. There are to be grain-chutes with slides on first floor, and connected with bins above. Build hay and manure traps. Sheathing between stalls to be of sound spruce. Build a seat in man's room and fit up closet in same in the usual manner. Put in gas and water pipes.

Hardware. — There is to be good and selected hardware used.

Painting. — All inside work in first story and man's room to have two good coats of shellac. Outside finish to be painted two good coats any color desired. Shingles on roofs and walls to be stained and clapboards to be painted.

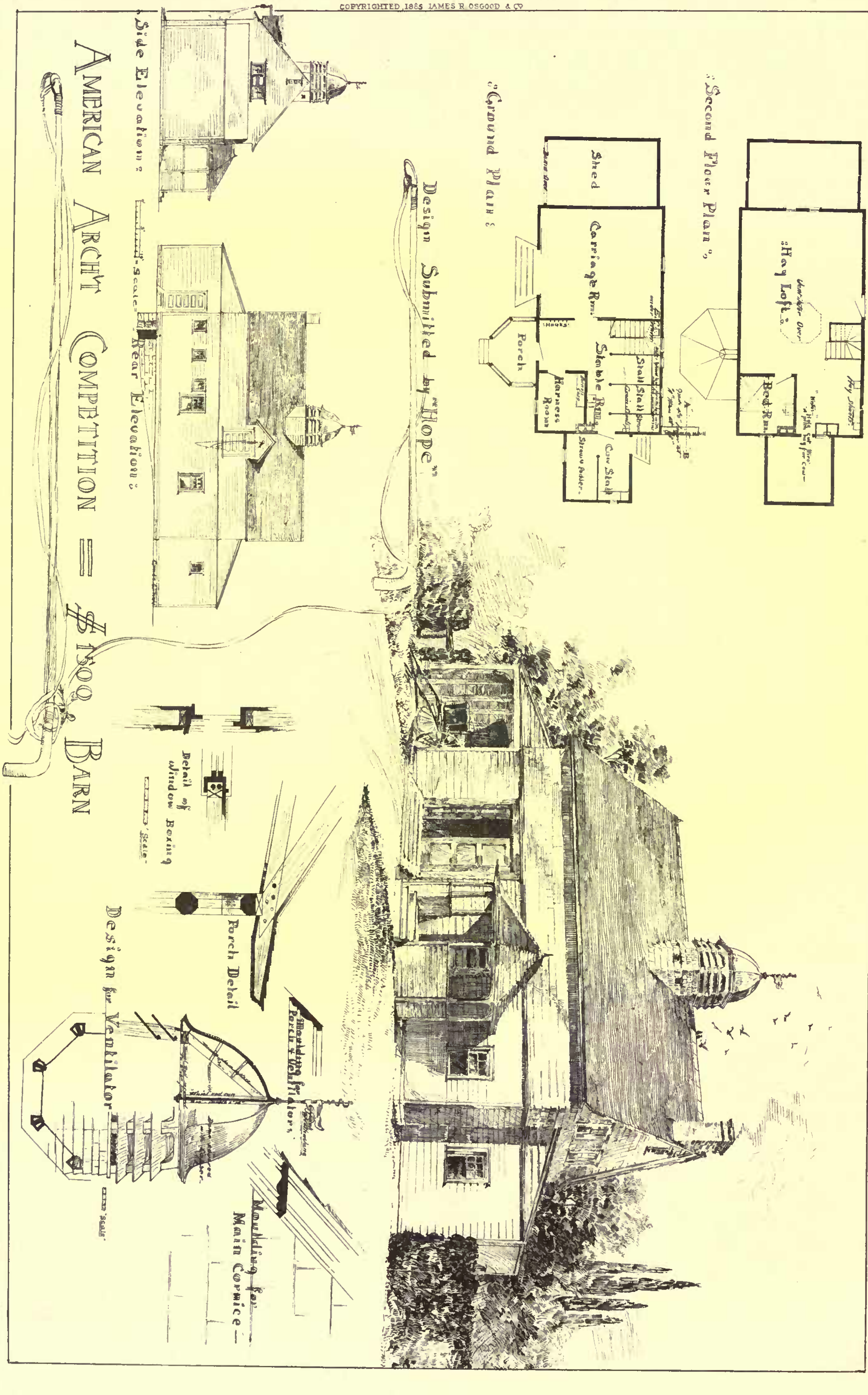
Miscellaneous. — Fit up a drinking-trough in stable. Build a blanket-rack in carriage-room.

The cost of this stable was carefully estimated, and is to cost complete as described the sum, viz.: $1,441.00. "*Hope.*"

THE CATHEDRAL OF ST. SAUVEUR, BRUGES, BELGIUM.

This building, which has the distinguishing characteristic of being built of brick, was built between 1482 and 1527, the choir being the oldest portion of the structure.

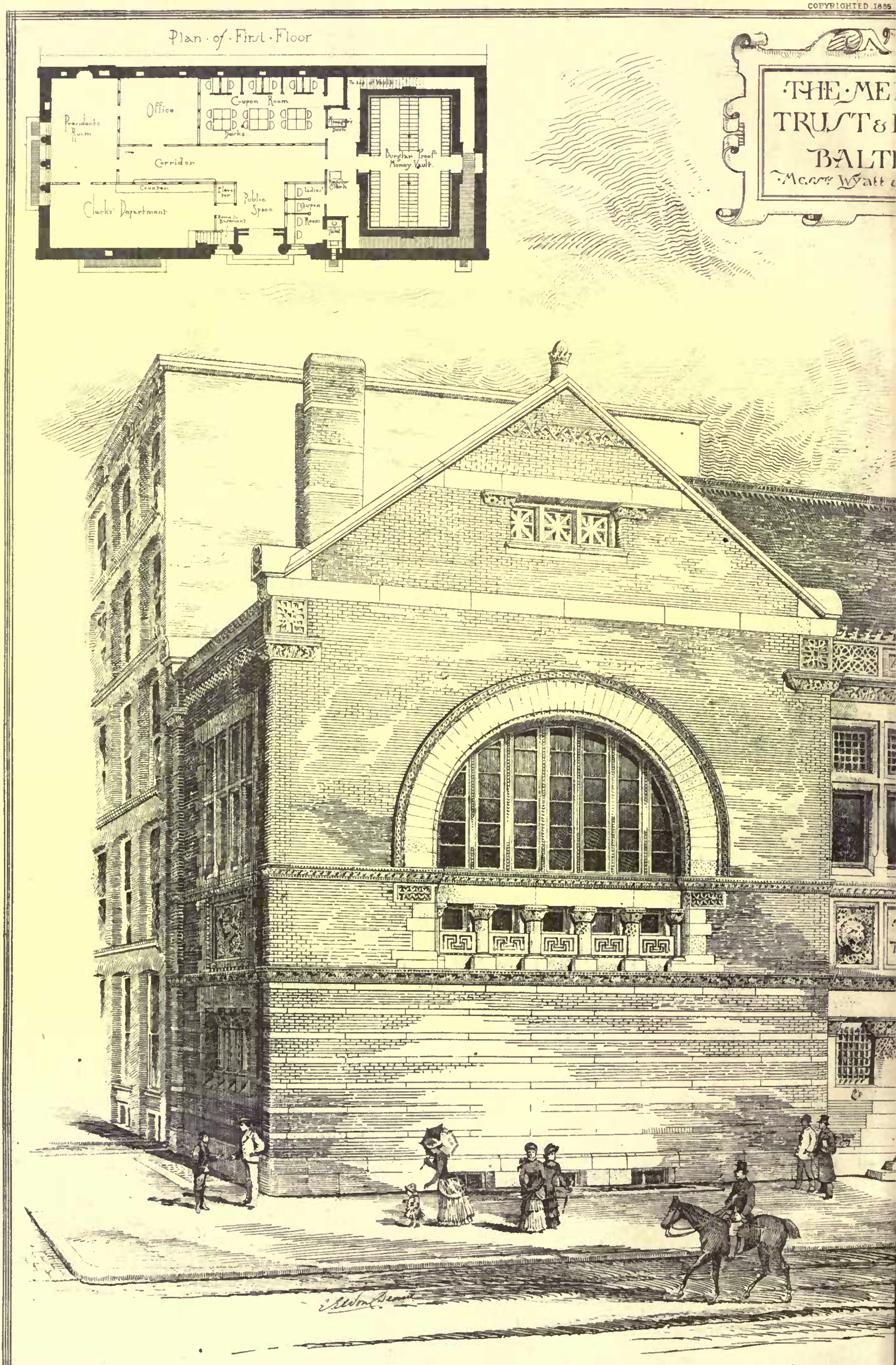
A STREET IN HALBERSTADT, GERMANY.


American Arch't Competition = $1500 Barn
Design Submitted by "Hope"
Side Elevation
Rear Elevation
Scale
Ground Plan
Second Floor Plan
Shed
Carriage Rm.
Porch
Harness Room
Stable Rm.
Stall
Cow Stall
Hay Loft
Bed-Rm.
Detail of Window Boxing
Scale
Porch Detail
Design for Ventilator
Scale
Mouldings for Porch & Ventilators
Moulding for Main Cornice

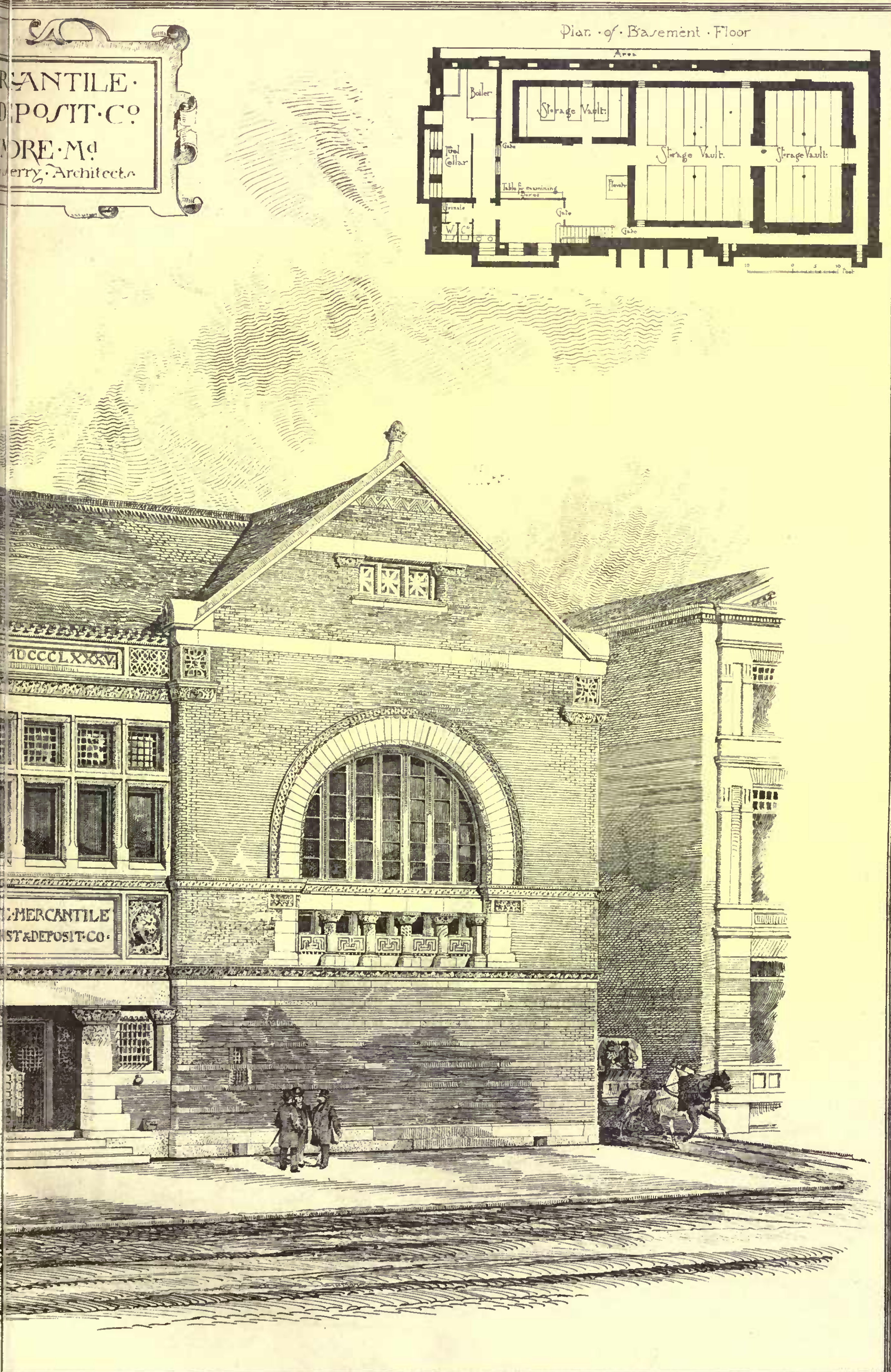


Old Houses, Halberstadt, Germany. – 1884.

HELIOTYPE PRINTING CO. BOSTON


Plan · of · First · Floor
Presidents Room
Office
Coupon Room
Desks
Corridor
Counter
Clerks' Department
Public Space
Ladies'
Coupon Room
Burglar Proof Money Vault.
THE·ME
TRUST &
BALTI
Messrs Wyatt

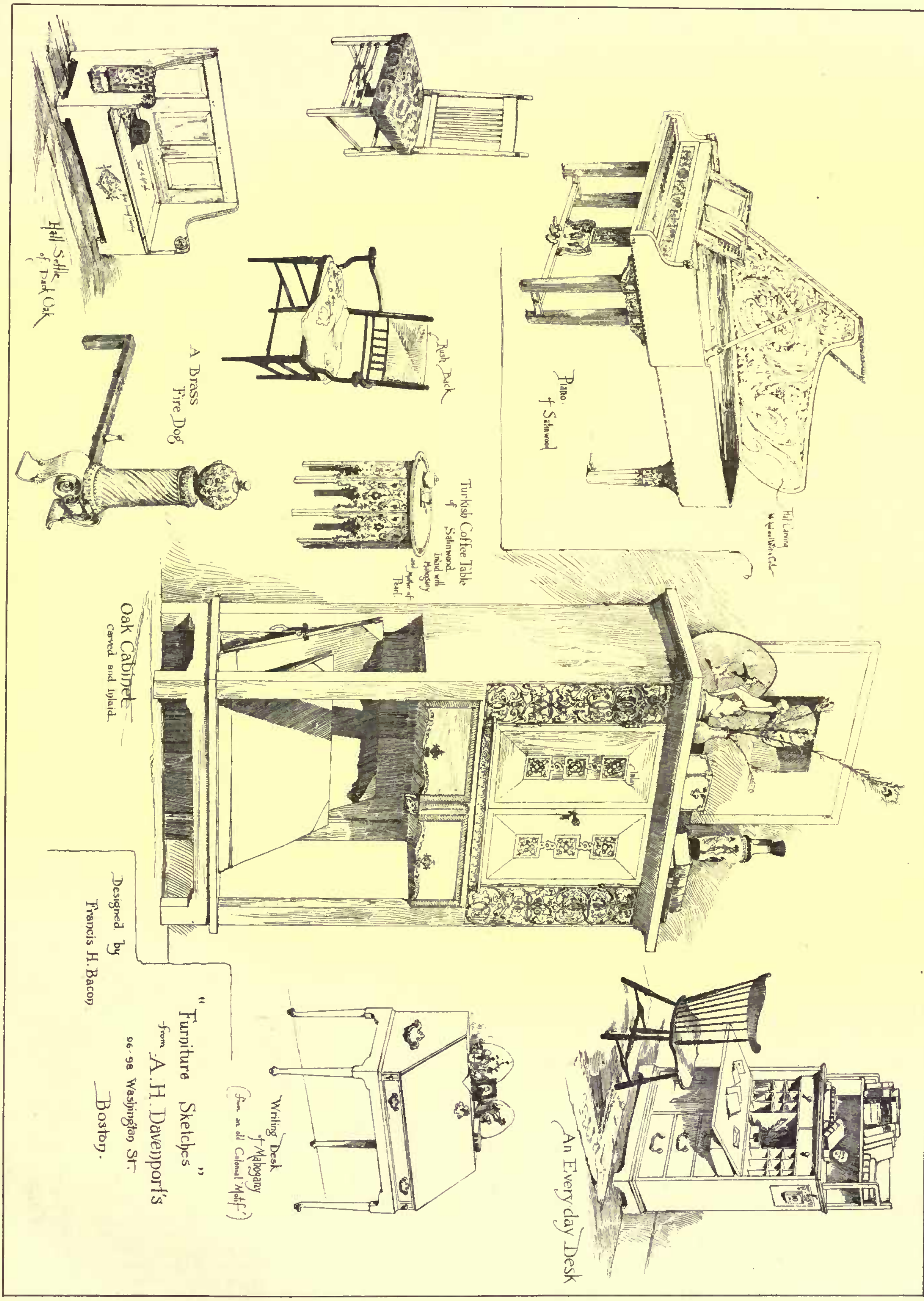
...R. OSGOOD & CO



HELIOTYPE PRINTING CO. BOSTON.



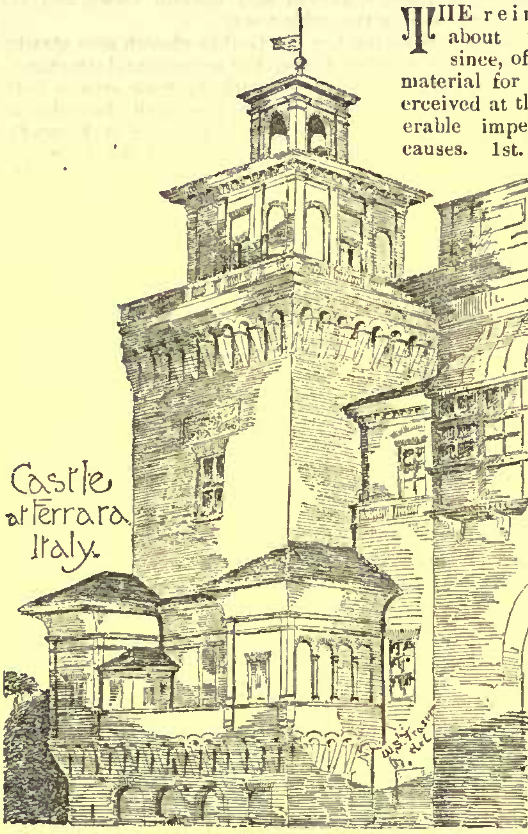
Cathedral of St. Sauveur, Bruges, Belgium.—1884.


Hall Settle of Dark Oak
A Brass Fire Dog
Rush Back
Turkish Coffee Table of Satinwood inlaid with Mahogany and Mother of Pearl
Piano of Satinwood
Oak Cabinet Carved and Inlaid
Designed by Francis H. Bacon
"Furniture Sketches" from A.H. Davenport's 96-98 Washington St. Boston.
Writing Desk of Mahogany (from an old Colonial Motif)
An Everyday Desk

FURNITURE DESIGNED BY MR. F. H. BACON, ARCHITECT, FOR MR. A. H. DAVENPORT.

THE MERCANTILE TRUST AND DEPOSIT COMPANY'S BUILDING, BALTIMORE, MD. MESSRS. WYATT & SPERRY, ARCHITECTS. BALTIMORE, MD.

CONCRETE AS A BUILDING MATERIAL.[1]



THE reintroduction, about twenty years since, of concrete as a material for building walls, erceived at the time considerable impetus from two causes. 1st. The invention of appliances or moulds for forming the structural portions of buildings of a monolithic character. 2d. The superior properties possessed by Portland cement as a matrix in place of ordinary lime. And as an important addition to our stock of building materials concrete would undoubtedly have received more public attention, and become more generally adopted, if it had not been subjected to the fate of most inventions — for, as usual, we were told that concrete was to be the salve for every sore in building operations; there were to be no more damp walls or tumble-down walls, for it was impervious to moisture, and I don't know how many times as strong as any brickwork. Mechanics would be no longer needed, for the appliances could be fixed and the work executed by any ordinary laborers; while its cost was less than one-half that of the commonest specimen of brick-walling. Many other improbable statements of a similar character were made public, one enthusiastic concrete builder offering, in a trade journal to prove, or otherwise to forfeit a considerable sum of money, that concrete was ten times stronger than any other building material; while, on the other hand, a concrete building in course of erection by the same individual soon after collapsed without any apparent cause whatever. But the remedy for all this clap-trap was simply a question of time, and, as a matter of course, we do not now hear such extraordinary statements as these put forth. Concrete is now simply recognized as an important addition to our building materials, and a valuable factor in construction under certain conditions, and its employment for many purposes in connection with building is perhaps more extensive and more varied than many are aware of. Its introduction as a wall-building material served a good purpose in certain ways. For example, previous to then, little care or trouble was taken in many instances about the concrete used in foundations, the fact being that no means existed to test its quality or strength after it was buried in the trenches dug for its reception. The usual formula of a certain proportion of Dorking lime and Thames ballast, to be well mixed and thrown in trenches from a certain height, was the sum and substance of many specifications for ordinary buildings, and in some instances is so even now. But the quality of the concrete used in foundations is equally as important a matter as if the walls themselves were to be constructed of the same materials, especially with buildings of considerable altitude, or where the ground is of a treacherous character. The knowledge gained from experience of the immense strength possessed by good concrete has engendered various considerations in connection with the ordinary system of executing foundations and footings of walls; for instance, assuming that the concrete in foundations is of first-class character, it is submitted whether brickwork footings which are intended to distribute the weight of the walls over a greater superficial area, and which are not calculated to be of any practical use in strengthening them laterally, are of any service whatever when the sustaining medium (the concrete) is incapable of yielding from the superincumbent load it has to bear. And, again, whether it would not be practicable in many cases, as for instance in clay soil, to excavate the ground of a wedge-shape section, the large end downwards, reducing the thickness of the concrete at top to that of the wall itself, or somewhat more, and increasing it at bottom so as to give the foundations themselves a broader base, and thereby more correctly define, without any increase of materials, the principle of correct distribution of strength. Practically the foundations of walls should not be dependent upon the ground for lateral support; they should be strong enough to permit the soil on either side to be excavated to the bottom of foundations, if needed, after the building has been erected, and without a possibility of danger. But how many new buildings would be safe under this ordeal? The difference of cost between good and bad concrete is so little that there is no excuse for an inferior material for foundations in any building with a claim to substantiality.

There are many opinions and many delusions in connection with the apparently simple subject of "concrete"; for instance, with regard to the size of the aggregate, it is usual to specify that it shall not exceed certain dimensions, usually that each portion shall pass through a two-inch, or sometimes one-and-one-half-inch, ring, and even a one-inch ring or screen is not an uncommon stipulation, whereas, in point of fact, the larger a certain portion of the aggregate may be the better the concrete, simply because the larger the particles composing the aggregate, the less superficial area to be cemented by the matrix. In other specifications it is stated that the aggregate shall be of a certain uniform size, with a fixed proportion of sharp clean sand mixed therewith. This, especially if cement is to be used as a matrix, is entirely wrong; and another plan is to instruct water to be added to a measured quantity of aggregate, and the amount of the former needed to fill up the crevices of the latter is supposed to represent the proportion of sand necessary to add to the bulk. This is a fallacious system, because the sand could not by any means occupy the minute crevices available for water. Practically, what is required for an aggregate in good concrete as far as size is concerned, depends upon the thickness of the foundations, or walls, or floors, or whatever purpose it is required for, and no hard-and-fast line can be drawn for these relative dimensions; but whatever the size of the largest, the smallest should never be finer than Thames sand. The thicker the wall or foundation the larger a portion of the aggregate may be, because homogeneity is then rendered more easily attainable, the only limit to size being that homogeneity must be the first consideration.

Approximately, it might be safe to specify for work up to nine inches thick all that would pass through a two-and-one-half-inch ring, and, above that thickness, through a three-and-one-half-inch ring, conditionally that the intermediate quantities were so varied both in size and shape, that without any undue proportion of the coarse sandy element, the whole should, when subjected to gentle impingement be rendered perfectly homogeneous. I admit that in the absence of considerable practice, it requires some judgment to fix upon this condition of materials; but approximate results could be obtained by making up samples of concrete in boxes, each holding a cubic foot, varying the proportions, and when consolidated removing the wood cases, and breaking the cubes of concrete to pieces. The sample that was perfectly homogeneous, and which contained the least proportion of fine, with the greatest proportion of coarse materials, would represent the best consistency of aggregate for ensuring the largest amount of strength. And it must be self-apparent that the nearer each unit of the aggregate approached in shape to an irregular polygon the better the particles would interlock with each other, and for this reason sea-beach and river shingle never make the best aggregates; and breaking by percussion, such as by hard hammers, produces aggregates too uniform in size, and which require the fine and intermediate portions to be obtained by some other means and added thereto. Probably the best way of obtaining an aggregate suitable in size and shape, and, as a rule, possessing somewhere about the relative sizes and proportions, is to use a Blake's stone-crusher. Where this is done it will be found, however, that the harder the aggregate material to be crushed, the less the proportion of fine and intermediate sizes produced, and due allowance must be made in such cases by abstracting a portion of the finer quality, or adding some obtained from other sources, as circumstances may require; usually, however, the latter is unnecessary. Although it is customary in the neighborhood of London to employ Thames ballast for concrete, it is far from being the best material for the purpose; the harder variety of stones, hard brickbats, brick clinkers, coke, and slag, are all more suitable than flint or flinty gravel. In point of fact, old building-materials are often carted away as rubbish or for road foundations which would make most excellent concrete if broken up, and Thames ballast is as often brought miles, for an aggregate for the formation of concrete for new buildings to be erected on the same site. If a mass of ballast or flint concrete is broken with a sledge-hammer after complete solidification has ensued, it will be found that some portion of the gravel will show clean surfaces from want of perfect adhesion; with any of the other materials named, this is absolutely impossible if the concrete is executed under proper conditions. One of the most important factors in connection with a good aggregate is that it should be clean, and I can safely affirm that the more experience one has in the use of concrete, the greater will be the care taken to thoroughly wash the aggregate. And this is more essential where Portland cement is used than with lime, for as matrices they essentially differ from each other in their special properties. A small proportion of

[1] A paper read before the Society of Architects, by Thomas Potter, M.S.A., of Alresford.

fine sand may not be highly injurious in the aggregate if lime is the matrix, more especially as the proportion of the latter is usually greater than where cement is used; but with cement the case is different—it has but little affinity for any material as fine as itself, and it also possesses the strongest adhesive and cohesive properties when unmixed with sand. The usually small proportion employed also, ten to fifteen per cent, although ample to secure an excellent concrete produced under the best conditions, is insufficient to allow the presence of a quantity of deleterious foreign matter in the aggregate. If the material for aggregate is absolutely clean previous to being broken, it still requires washing afterwards; for the action of percussion, say, if reduced by hand-hammers, or of compression, if reduced by a stone-crusher, produces a quantity of dusty particles. The necessity for cleaning, where no foreign matter existed previous to the reduction of the aggregate, will possibly be disputed; but it can readily be proved by mixing samples of cement with the water in which some clean broken aggregate is washed, and testing the sample in a cement-testing machine. And as the cost of washing would but rarely exceed six pence per cubic yard, I submit the concrete is increased much more than that amount in value by the elimination of all the dusty and fine-grained constituents of the aggregate.

With regard to the matrices employed for concrete, there is a unanimity of opinion which admits of no doubt that for strength and other qualities there is nothing to surpass good Portland cement. But poor limes of hydraulic character, such as that made from lias limestone, possess very considerable strength, and are adapted not only for concrete in foundations, but for walls themselves. It can safely be affirmed that concrete made of a suitable aggregate, and ground blue lias lime, in the proportion of one of the latter to five or six of the former, is as strong as ordinary brickwork, and can be used for walls of any description where brickwork can be employed. But there is this difference in the natures of lime and cement, that whereas with the former a fixed proportion of sand is absolutely necessary for the chemical change which converts the lime into mortar, with cement the case is the reverse; for although the sand is essential to fill up the interstices of the aggregate next above it in size, it has the effect of weakening the adhesive properties of the cement. And here we obtain one of the main contributory causes to both good and bad concrete. Blue lias lime is supposed to attain its normal strength as a mortar when it is mixed with double its bulk of coarse sharp sand; when, therefore, the aggregate contains either more or less than this proportion of sand to lime, so is the cementitious nature of the matrix reduced, and a lime concrete composed of six parts of an aggregate to one of a matrix should therefore consist of one part of lime, two parts of coarse sand, and four parts of a coarser and irregular-sized material. With cement, on the other hand, the aim is, or should be, to do with as little sand as possible, but not to risk that *sine quâ non* of good concrete—homogeneity. It is a mistaken notion to suppose that lime used as a matrix will expand or "blow." It will undoubtedly do so if used directly it is ground; but it should be treated in the same way as cement, viz., spread out on a wood floor away from all damp, and not used for two or three weeks at least after having left the millstones, and there will be then no danger whatever from expansion. Nor will this cooling in any way lessen the ultimate strength of the lime, nor will it affect its setting properties so far as to render building operations tedious if employed for wall building; practically it requires about double the time of Portland cement to set or harden.

As blue lias lime is oftentimes procurable in neighborhoods where Portland cement is a costly article, it is somewhat surprising to find it so little used for concrete building; where, however, the cost of cement is not handicapped too severely by the expense of carriage, the gain in cost, all points considered, is but little. It is not an uncommon practice to employ lias lime concrete as an underpinning for walls of old buildings which have given evidence of sinking, using the lime fresh for the ostensible purpose of causing the concrete to expand, and thereby pin, or wedge up the building. This I submit is wrong in principle; the lime in no way causes the aggregate in itself to expand, but forces the particles asunder, and instead of forming a dense mass, creates fragmentary blocks, whose effect is entirely at variance with the object of the concrete. If we mould a sample of concrete made with fresh lime in a box, or frame, and when hardened take away the wood casing, it will sooner or later crack and split up into small portions. The practice of "packing" concrete—that is, depositing in layers, or otherwise, boulders of stone, or similar suitable materials in the soft mass—reduces the cost, and is by no means objectionable, provided it is thoroughly incorporated with the concrete itself, and this forming a portion of the aggregate, is simply an illustration of the principle that the larger a portion of the aggregate the better—always on the understanding that perfect homogeneity must not only be aimed at, but obtained. There are some objections to concrete as a wall-building material. For instance, it has an inherent tendency to show cracks on the finished surface, especially if stuccoed to a smooth and even face with cement. All building materials, as is well known, are subject, more or less, to change of form with change of temperature; but in an ordinary way, with ordinary materials, the change is imperceptible when spread equally over the innumerable mortar joints of the materials of construction. But this decided evil in concrete is very much lessened if the cement is not used too fresh, and the work is not hurried. I have found, too, that the time of year during which concrete work is executed has a marked difference in this respect upon the behavior of the walls; if performed during cold weather there is but little after-evidence of contraction or expansion, while if done in hot weather these cracks seem inevitable and irremediable. As to another objection applied to concrete, the difficulties of alterations to existing buildings, arising from the tenacious quality of the constituents, I think, is evidence in its favor, for probably no owners of property would prefer weak walls to strong ones, or, as a simile, would for such a problematical reason select brick walls built in common lime mortar to those built in cement mortar, assuming they had a choice, and the cost of each were identical. Another objection is the difficulty of suitable means for the fixing of joinery and other fittings. Wood bricks can be built in as in brickwork, but are not advisable. Wright's fixing blocks, however, are available, and superior to wood bricks, without any of their shortcomings, and at but very little cost. When a small plug is likely to be required for a single nail, such, for instance, as for narrow architraves, pieces of bell-wire tube two inches in length, filled with sand, can be built in, the sand being afterwards withdrawn and a wood plug inserted. I might mention this as an excellent way of providing means for wiring concrete garden walls for fruit and flower trees.

Concrete walls convey sound, unfortunately, only too well, and the better the concrete the better conductors they become; there appears to be no remedy that I am aware of, except the ordinary and objectionable practice usual with brick walls, such as battening, covering with dry hair-felt, etc. But its greatest defect in the eyes of most people is that it is assumed to be difficult to treat artistically, and no doubt there is much to be said against concrete on this head. Stucco is, as a rule inadmissible now, and it is unfortunate that the introduction of concrete was, for some reasons, fifty years too late, for then the cry of sham had not taken so deep a root as now, and in many cases buildings for which it is admirably suited are built with other materials, because of the inevitable stucco. But concrete can be moulded into almost any shape or size, and dyed to any permanent color, and it is difficult to know why it should not be as much recognized as a facing and ornamental material as terra-cotta, for it has the advantage of the latter insomuch that it can be produced with absolute truth of form, which, with terra-cotta, appears to be out of the question.

The specimens of concrete work produced by Messrs. Lascelles and others are equal in workmanship and appearance to carved stone or cut brickwork, with the advantage of being undamageable by frost and more economical in cost. Rough-cast, pebble-dash, and other surface finishings have been introduced according to individual tastes and fancies, and for buildings in the country are very good methods of finish. Facing slabs of concrete have also been used. Mr. Marsden, an architect of Liverpool, invented a system by which the inside and outside slabs were tied together by iron ties, and the cavity filled with concrete. Mr. Charles Drake introduced a similar system, with the addition of dovetailed grooves cut in them to assist in securing them to the core, and I made some for a special purpose some years since, doing away with the iron ties, and using dovetailed lugs of concrete cast on the slabs themselves. This enabled walls to be built of brickwork externally, with a core of concrete, and facing slabs on the inside. Made in different colors for the inside of the walls, instead of plastering, they have been employed by the architect of the Epsom Town-hall, Royal Albert Dock Hotel, and other structures, Messrs. Lascelles being the builders. It does not appear to be so easy to get any other stain for concrete except a deep red, and for which mineral oxide is a suitable medium. Stains of an earthy character deteriorate the quality of the cement, otherwise almost any variety of tint or shade is possible. I have used bullock's blood instead of water, and obtained an excellent tint and hardness of finished material; but there are obvious objections to its general use. The question has often been raised as to the amount of water necessary for the mixing of concrete, and the general view appears to be that great care should be exercised in not applying too much; but probably too much is better than too little. Without sufficient water homogeneity and perfect cohesion are impossible; whereas if too much is used the cement parts with all or a greater portion not required for setting. In such instances clear water may be found on the surface of the concrete in foundations, and in the case of concrete resting upon boards or centring, the clear water will pass from it through the joints of the boards in considerable quantities.

With regard to the assumed expansion of Portland cement concrete, it is doubtful if any takes place; a continuous floor, one hundred and thirty feet in length, on iron girders, commenced and finished within a fortnight, never affected the end walls enough to disturb their perpendicular position in the smallest degree. The best use for concrete, however, is undoubtedly for floors—best because there is no other material can approach it for facility of execution, strength and economy. At present it may be said that the construction of concrete floors—by which I mean floors carried by iron girders or other means in contra-distinction to concrete laid on the natural ground and designated paving—is almost in the hands of specialists; and although for many reasons better so than if otherwise, it greatly restricts its use for private buildings. The limit of this paper and the importance of this branch of the subject render it impossible to enter upon the question of floor construction; but there are a few general matters in connection therewith worth passing consideration.

An American journal lately reported that a high authority in that country had proved that concrete was not a fire-resisting material;

but we are not told what the concrete referred to was composed of. In point of fact, if the aggregate was of a flinty character, it would under a moderate test, no doubt, go to pieces; but fire-brick, hard-burnt brick, coke, or slag as aggregate, will stand the effects of a conflagration as well as ordinary brickwork. Mr. Hyatt, of Farringdon Street, some years since tested concrete beams in which iron was embedded, and after being some hours in a furnace they were found uninjured; and when tested by means of Holtzapffel's thousandth gauge, it was found that the expansion of both materials was to all intents and purposes the same, and that iron and concrete could be used in combination as a fire-proof material without danger. It has been usually assumed that concrete floors will withstand no vibration and sustain no deflection; but Lieut-Colonel Seddon some years since, whilst conducting some experiments, proved by actual results that this theory is far from being correct; for a concrete slab under severe trial deflected without breaking to such an extent as to tilt up on the outside edges, and leave a cavity between these edges and the walls it rested upon. A number of men also jumped simultaneously upon the same slab, and although causing perceptible vibration, the slab remained perfectly sound, and a beam weighing three hundred and twenty-nine pounds dropped endways from a height of four-and-one-half feet on to the centre of the slab had only the same effect, the concrete remaining uninjured. Mr. Hyatt also found that a beam of concrete, free at all points, bent considerably when exposed to a great heat, but returned to its normal shape when allowed to cool. Much antipathy prevails to a finished surface of cement for concrete floors and pavings of dwellings; and even for agricultural laborers' cottages a strong feeling exists against it. This is accelerated by the cold surface of the cement inducing condensation of watery particles, in damp, changeable weather. Where the surface can be covered with a carpet or cocoanut matting, this objection is of course removed, although wood is more generally preferred. Where circumstances permit, a perfect floor may be formed by covering with or glueing down linoleum to a smooth surface of cement for the centre of rooms, and employing parquetry fastened down with Eberhard's patent glue for the borders. Provision must of course be made for the finished floor surface to be level or flush throughout, and a carpet just to cover the edges of the parquetry all round completes the arrangement. In this case the concrete and cement must be absolutely dry, or the parquetry will burst up, and the linoleum expand or wrinkle, eventually cracking or splitting as the concrete below becomes dry.

For cottage and other common floors ordinary deal battens in narrow widths, and half or three-quarters of an inch in thickness, may be nailed securely and permanently to concrete made with soft bricks or coke, the ordinary sheet floor brads being well adapted to fasten the boards down with. This has been used in a number of laborers' cottages apparently with complete success, and Mr. Hall of Moorgate Street treated some floors in a similar way a year or two since for some modern dwellings in the city; and possibly others may have adopted the principle as an economical system of cheap flooring, possessing very many advantages over ordinary floor joists and thick flooring boards. As in the previous case, the concrete should be thoroughly dry. For pavings of court-yards, basements and similar places concrete is an excellent material laid monolithically, provided there is no probability of periodical upheavings being required to examine contiguous drains; where such a possibility exists then the paving should be of ordinary concrete slabs, such as laid down for footways by the Victoria Stone Company. This paving is an example of what can be accomplished with concrete made with the best materials and under the best conditions. Among the multitudinous articles used in buildings or in connection therewith made of concrete, may be mentioned stairs, sinks, troughs, sills, copings, pier-caps, ridge-tiles and others of a similar character. For rough lintels over door and window openings it ought to quickly supersede wood; for while it is or may be made as strong as York stone, there is practically no deflection and no decay, as with timber, while in case of fire they would help to support the walls; whereas the destruction of wood lintels is oftentimes the cause of their collapse; and in addition the cost of concrete lintels, as far as my experience goes, is always below that of good Baltic fir timber. For water-tanks nothing is so suitable as concrete; it is unyielding in character and economical in cost, and many hill farms and outlying cattle-sheds have of late years been supplied with excellent water collected from slate or tile roofs into concrete tanks, and which formerly depended for their supply upon the runnings from roads drained into clay ponds, and oftentimes little better than sewage. The use of concrete, both at the present time and in the future, involves so many issues, and its application to building purposes is gradually becoming of so varied a character, that I regret limit of time has only permitted me to refer in a very brief manner to some of the more important points in connection with the subject. The various methods of building walls, the appliances in use for the purpose, and the construction of fire-proof and other concrete floors are necessarily left untouched. I have endeavored simply and briefly to call attention to some of the less generally known, but most vital, points in connection with the production of good concrete, also to several matters of detail, and last, but not least in importance, to its faults. Having enumerated some of its good qualities, it is super-essential I should acknowledge not only its short-comings, but candidly avow them, and by calling attention thereto leave to others an opportunity of suggesting or practising means to remedy them.

A BOW-STRING TRUSS.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs, — Can you give, or tell me where I can find, information in regard to the following? Want to cover a room 90′ wide with a truss roof; trusses to be placed 20′ apart and to be similar in shape (bow-string) to that in Figure 212, page 419, Kidder's "*Architect's and Builder's Pocket-Book,*" but of wood instead of iron as he gives it. Roof will be of corrugated iron. Want to find dimension of members and what rise will be best for upper chord and for lower chord. Have looked through all the authorities on the subject and can find no data for wooden trusses of this form, although I know they are used.

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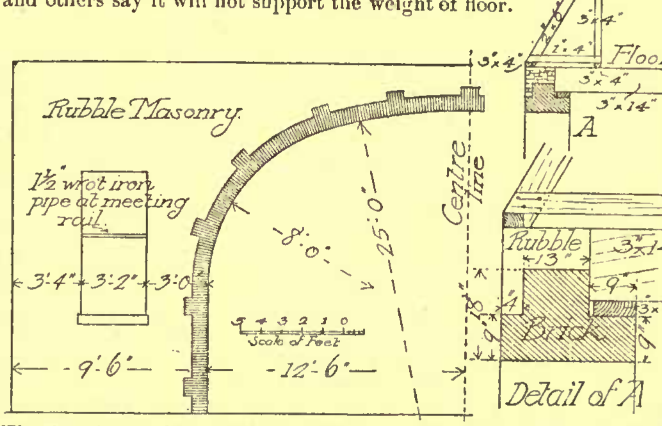
[THE best way would be to design the truss, and calculate the strains from the beginning, or employ some engineer to do so. Unless some truss could be found ready-made, of exactly the dimensions required, it would be unsafe to adapt the sizes of parts from an example nearly similar. The relative rise of the upper and lower chords, for instance, affects very greatly the strains in them. The best construction would be to make the lower chord horizontal, and the rise of the upper chord about one-fourth of the span. If it is necessary to keep the lower chord up in the middle to gain head-room, its size, as well as that of the upper chord, must be very much increased. If "Subscriber" wishes to do all the work of calculation himself, he will find Greene's "*Graphical Statics, Part I,*" an excellent guide. — EDS. AMERICAN ARCHITECT.]

STRENGTH OF AN ELLIPTICAL ARCH.

BALTIMORE, MD., April 30, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs, — The arch of which I give one-half elevation and section below has been executed in this city. I am a student and would like to know whether the arch will stand or not. I obtained exact dimensions from the builders, and have asked several engineers and architects, and some say that it will carry any load that can possibly be put on it, and others say it will not support the weight of floor.



The floor is 24′ clear span and joists rest on a 3″ x 8″ stringer full length of arch. Roof shingled. Walls built of rubble masonry. Arch of hard brick in cement mortar, built as shown in sketch; outer rim, 9″ x 4″; middle rim, 18″ x 13″; inner rim, on which joists rest, 9″ x 9″. These rims are thoroughly bonded together. The work was done during the cold of last winter. The centres have been struck some three weeks and there are no signs of any cracks anywhere.

Is an elliptical arch of the above dimensions as strong or stronger than a segmental arch with a radius and span of 25′?

Very respectfully yours, C. E. D.

[WE believe the arch would not be safe beyond a question. — EDS. AMERICAN ARCHITECT.]

WHAT MAY PROPERLY BE REQUIRED OF A COMPETING ARCHITECT.

NEW YORK, May 11, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs, — Two or three years ago you published a letter of mine calling attention to the fact that a commission appointed by the Legislature of Texas to build a new capitol for that commonwealth, and which discretely measured the average ability of laymen to judge of the comparative merits, on technical grounds — whether in relation to construction or æsthetics — of several competitive projects therefor, had called on a prominent architect of this city, Mr. N. Le Brun, to arbitrate on the question. Permit me now a little further use of your valuable columns for the permanent record of another instance of similar praiseworthy modesty and sagacity.

Looking over the "First Annual Report of the Board of Capitol Commissioners of the State of Georgia for the year ending October 4, 1884" — which has recently come into my hands — I find that Mr. George B. Post of this city was asked for and rendered a similar service in their case, the Commissioners "recognizing," as their report says, that their "task was one of great delicacy, requiring a high degree of professional skill and experience."

Mr. Post's observations in the matter are quite calculated to benefit the profession in its relations with the public, inasmuch as they fix attention on the fact that formulated detail cannot be afforded — even if it were necessary, which it is not — and should not be expected in the preliminary rendering of a building project, as to

make the necessary computations for constructional purposes, and the exact specifications required for the guidance and coördination of the various agencies involved, from foundation to dome, in the erection of so important an edifice — and it may properly be added that the rule applies proportionally to any structure, however moderate its grade — "would have required very much greater cash outlay on the part of the competing architect, than the full award agreed to be paid to the successful competitor."

Mr. Post adds: "In my opinion"—and the opinion of an architect of his important and extensive practice can hardly fail to carry great weight — "the premium should be awarded to that plan which in its general features of interior and exterior arrangement and construction, and character of interior and exterior design, most fully meets with the approval of the Board, and its author should be appointed architect for the erection of the Capitol, provided that he can show that he can remodel his plans to meet the views of the Board and the requirements of the State, both in details of arrangement and cost, without either departing from the peculiar features of his plan, or of his interior or exterior design."

Yours truly, A. J. Bloor.

NOTES AND CLIPPINGS.

Bermuda Graves. — Mr. W. A. Croffut says that "all the graves in Bermuda are excavated 8 or 10 feet deep in solid rock. Then the 'founder of a family' is deposited at the bottom, where he belongs, and the other coffins are placed directly upon the top of his till the rocky sepulchre is full. I saw one of these graves, bearing the tender epitaph above it, 'Here lies our father, mother, three brothers and one sister.' Bermuda is the most social place I ever saw."

Collapse of a Large-Sized Sewer. — A case of the above has lately happened in the execution of the Dorking sewerage works, and since, although they are not without precedent, such cases are happily rare, particulars doubtless will be of interest to your readers. The pipes were 21 inches in diameter, and 1 3-4 inches thick (Jennings's make), and were first-class specimens of stoneware pipes. They were laid in a trench 13 feet deep and 4 feet 6 inches wide. The subsoil strata were alluvial, — upper green sand and gault clay; the latter was nobbly and full of water when the trench was excavated, but was got into a good dry condition by means of small agricultural drains laid as subsoil pipes 6 inches below formation level on each side of the trench. The sewer-pipes were laid in the ordinary manner on their barrels, with joint holes for the sockets, which the latter probably touched throughout, but upon which they had no undue bearing. The joints were Stanford's patent (the chipping for which doubtless slightly weakened the pipes), over which a band of clay was worked to prevent leakage. The mode of filling-in after the pipes were laid, carried out in accordance with the specification, was unique. The finest material was selected (sifted, if necessary). It was laid to a height of 2 feet above the highest parts of the first three pipes; other similar material was then thrown upon that and carefully pushed along on to the next pipe, and so on, no ramming whatever being permitted until this fine, soft filling material was 2 feet above the highest parts of the pipes. The remainder was then thrown in and rammed, there being two rammers specified to one filler. The pipes being thus without lateral support (for the loose filling could have been of no possible use in this respect), and practically arches without abutments, it is scarcely surprising that every pipe collapsed as far as the ground had been filled in. The ramming applied to the last 9 feet of filling consolidated it into one mass, 4 feet 6 inches wide, which settled bodily. There were 4 feet of soft unrammed filling at the sides of the pipes, and only 2 feet on top of them, so that when the mass subsiding had compressed the soft filling on the top of the pipe to its greatest density, the filling at the side was only half compressed; consequently, 13,000 pounds of earth ultimately settled upon each pipe, whose crushing strength was not equal to one-half that weight. — *Ignoramus, in The Builder.*

The Western Union's Pneumatic Tubes. — The system of dispatching messages to comparatively long distances through pneumatic tubes has been operated by the Western Union Telegraph Company for about four months, and its perfect success is assured. It is intended to make this system the centre of an intricate pneumatic railway which shall connect every Western Union office in the city. Specifications have already been made to complete this ingenious purpose, which will be carried through with all convenient speed. The general scheme of transmitting messages through a tube by means of air pressure is not new, and has been for years successfully practised between the Dey Street office of the company and the newspaper offices. But the particular methods embraced in this new system have many original features. A trench from four to six feet beneath the surface of the street connects the Western Union office at Broadway and Dey Street with their up-town office at Fifth Avenue and Twenty-third Street. This site was formerly occupied by the old brown-stone mansion long known as the Peckham homestead. It was bought by the company a little over two years ago, and is intended for a distribution office for a large territory above Fourteenth Street. Work began upon the trench which runs through Broadway about eighteen months ago, during the strike of the telegraph employés. The trench contains six tubes. Four are of brass, four inches in diameter. Two are of iron about six inches in diameter. The brass tubes are designed for the pneumatic service. Two run without interruption from the operators' room in the top floor of the Dey-Street building to the basement of the Twenty-third-Street office. The other two are used for conveying messages to intermediate offices. The iron tubes are filled with telegraph wires already laid but not connected, to be used in cases of extraordinary business pressure. For transmission the messages are put into a leather box, cylindrical in shape, which fits the tube easily, capped at each joint with flanges that make it air-tight. In the basement of each building there are four engines of 250 horse-power each. These eight engines work the tubes, one in each building being connected with each tube. When the box of messages is slipped into the tube, one engine exhausts the air in the pipe before it and the other pumps air into the pipe behind it, and the box whizzes through at the rate of a mile a minute. About fifty separate messages are sent with every box, though it will hold one hundred. The tube is laid in sections of twenty feet, and elongations and contractions of the metal by changes of temperature are carefully provided for. In some places the closeness of the New York Steam Heating Company's pipes has made this allowance especially necessary. A small joint is inserted at points which will admit of an expansion in every 800 feet of pipe of two inches. Some time ago one of the steam pipes sprung a leak and the brass tubes became so hot that they could not be handled. This incident caused the greatest expansion yet observed, which was an inch and three-quarters in the 800 feet of tubing. The tubes, if worked to their greatest capacity, can transmit ten boxes or a thousand messages, each minute. Packages may be sent as well as paper messages, or anything else that can be got into the box. The direct tubes will not admit of any stoppages short of the terminal stations, but if messages are designed for way stations that are connected with the other two tubes, the operator at the dispatching office informs the operator at the receiving office by an electric bell. The receiving operator swings the section of the tube above him to one side, thus breaking the connection. He replaces it with a glass face to stop the suction, and a wire screen to stop the box at its end. His station is connected by a curved tube that comes up out of the street, and by the time he has completed these changes the box is before him and he reopens the tube. This system of reversible stop-covers that catch the boxes up just at the right station is something new in mechanical achievement. Air-tight collars protect the points where the sections of the tubing join. At distances of about 400 feet a man-hole is sunk into the trench and workmen may descend and make such repairs as are needed from time to time. Injuries to the pipe which impair its operation may be placed by passing a box through it connected with a rope at each end. In connecting the terminal station, which cost something more than one hundred thousand dollars, 76,400 feet of tubing is used. The cost of the engines, air-pumps and compressors is about as much more. The pressure of air in the compressed tank is thirty pounds to the square inch, and the perfection of the machinery has been shown by an experiment which proves the exhaust to be twenty-eight and one-half inches, almost an actual vacuum. — *New York Tribune.*

Incendiary Steam-Pipes. — The *Iron Age* takes this conservative position as to the possibility of hot steam-pipes setting fire to a building: "A great deal of misinformation exists concerning the danger arising from the careless disposition of steam-pipes. It is often asserted that fires are caused by the steam-pipes, used to convey the steam for heating a building, coming in contact with wood or other combustible bodies. The fact is that while there is much danger from improperly protected steam-pipes, due to the charring of the adjacent wood, it may well be doubted if the temperature of the pipe in ordinary circumstances can ever rise sufficiently high to set fire to the wood, whether charred or uncharred. The pressure of the steam employed for heating is usually below 60 pounds, and may safely be said to never rise above 100 pounds, per square inch. At this higher pressure the temperature of the steam is but 338° F., which is insufficient to produce actual combustion under ordinary conditions. We think this sufficiently proves that steam-pipes can never be the immediate cause of fires, but we would not have our readers understand that there is any the less danger in their careless arrangement. A case is reported by the daily press of this city, where a fire occurred in a private residence, and, after being extinguished, it was discovered that the wood-work between the partitions where the steam-pipes ran was scorched, which, taken together with the fact that the fire originated in the partition-wall, appeared to our contemporary conclusive evidence that it was caused by the heated pipes igniting the wood. Though not of a temperature sufficiently high to cause flame, the pipes had undoubtedly charred the wood in immediate contact, besides drying and heating all the surrounding materials. With such a condition of things, the smallest spark will start a fire which, except for the inflammable state of the wood-work, would have otherwise proved harmless. It is this indirect danger, which practically is of as much moment as an immediate one, that makes the question of steam-pipe laying of so much importance, for with charred wood and tinder-like particles of dust freely distributed throughout a building the precautions followed in a gunpowder factory are none too severe if absolute safety would be assured."

Straightening a Mill Chimney. — It was discovered on examination not long ago, says a contemporary, that a chimney 80 feet high, at a machine shop at Holyoke, Mass., was about 42 inches out of perpendicular. The method employed in righting was quite simple. A harness was located under the cornice, and two others below the first. Two lever jackscrews were placed under the girders of one of the harnesses on one side, and six jackscrews similarly on the other side. The earth was then carefully loosened about the chimney on the opposite side from that of its inclination and water poured in, after which the jackscrews were turned gradually, and the earth again loosened and dampened with the hose. After this process had been several times repeated the earth was puddled, and the whole stands now properly righted.

An Important Insurance Decision. — Judge Holmes, of the Supreme Court of Massachusetts, rules that in case of fire "the insured is not bound to give a detailed statement of his loss; that the insurance companies must ascertain the amount as they can and pay, or else they must stand suit. The plaintiff's right to sue is not dependent on having sent to the insurance companies a detailed statement of the loss which he has suffered." — *New York Evening Post.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

317,025. APPARATUS FOR FLUSHING SEWERS, WATER-PIPES, ETC.—James Scott, Denver, Col.

317,036. TRANSOM-LIFTER. — Chas. E. Steller, Milwaukee, Wis.

317,043. SINK-VALVE.—Charles M. Tack, St. Louis, Mo.

317,051. SASH-FASTENER. — James Walsh, North Adams, Mass.

317,053. ARCHITECTURAL COLUMN. — George J. Weber, Boonville, Mo.

317,055. SUPPLY-VALVE FOR THE FLUSHING-TANKS OF WATER-CLOSETS, ETC.—Henry C. Weeden, Boston, Mass.

317,072. SUPPORT FOR CENTRES FOR MASONRY ARCHES.—C. H. Ackerson, San Francisco, Cal.

317,076. LOCK.—Albert L. Becht, Paris, France.

317,077. MOSAIC OF GLASS AND LEAD GLAZING.—Henry F. Belcher, Irvington, N. J.

317,092. PLANE. — George A. Clifford, Peabody, Mass.

317,099. TRAP FOR SEWERS.—John Demarest, New York, N. Y.

317,101. APPARATUS FOR FORMING MOULDS FOR CASTING METAL PIPE. — Jacob K. Dimmick, Newport, Ky.

317,107. ARTIFICIAL FACING-BLOCK FOR BUILDINGS.—Henry G. Fiske, San Francisco, Cal.

317,121. SASH-HOLDER. —Geo. A. Grenville, Kingsville, Ont.

317,125. WOOD-FILLER.—Henry Hales, Ridgewood, N. J.

317,129. PROCESS OF PRESERVING WOOD.—Ludvig Hansen and Andrew Smith, Wilmington, N. C.

317,132. SPRING FOR DOORS AND GATES.—Nimrod Headington and Jesse S. Malin, Portland, Ind.

317,147. DOOR-CHECK. — Jacob Krumscheid, Boston, Mass.

317,170. BOLT.—William F. Morgan, Collingwood, Ontario, Can.

317,176. METALLIC PLATE FOR COVERING ROOFS AND WALLS. — Gottfried A. Niebeling, Remscheid, Prussia, Germany.

317,187. BIT-STOCK. — Johannes Th. Pedersen, Brooklyn, N. Y.

317,233. WOODEN TONGUE FOR JOINING FLOORING, ETC.—Irwin H. Spelman, Cortland, O.

317,238. WINDOW-SHADE AND AWNING.—David R. Stedman, Elizabeth, N. J.

317,250. LEVEL.—James Walsh, Thomas F. Murphy and Everett A. Clark, North Adams, Mass.

317,262. SASH-BALANCE. — Wm. F. Winship, Albany, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS.—Since our last report thirty-one permits have been granted, the more important of which are the following: —

G. W. Parke, 9 three-st'y brick buildings, commencing s e cor. Charles St. and Fort Ave.

J. T. King, three-st'y brick building, e s Valley St., between Chase and Biddle Sts.

John T. Gray, three-st'y brick building, s e cor. Broadway and Milliman Sts.

Louis Buckner, three-st'y brick building, n w cor. Harrison and Fayette Sts.

John M. Getz, 5 three-st'y brick buildings, s s Biddle St., commencing s w cor. Ensor St.

H. C. Barnes, 16 two-st'y brick buildings, s e s Nanticoke St., s w from Cross St.

Thos. O. Hittoffer, 5 three-st'y brick buildings, e s Fulton Ave., n of Patterson Ave.

W. Hildebrand, three-st'y brick building, s s Preston St., between Ensor St. and Holland Alley.

Western Maryland Church, stone church, s w cor. Gilmor St. and Lafayette Ave.

John Schultz, three-st'y brick building, n s Chestnut Alley, between Fremont and Brune Sts.

Boston.

BUILDING PERMITS. — *Brick.* — *East Third St., Nos.* 823, 825, 827 *and* 829, 4 dwells., 19′ x 40′; James Collins, owner; Michael Nolan, builder.

Shawmut Ave., No. 459, printing-office, 20′ x 40′; Freewill Baptist Print Estate, owner; Woodbury & Leighton, builders.

West Broadway, No. 131, dwell. and store, 25′ x 60′; Ellen Sullivan, owner; P. F. Hanlon, builder.

Columbus Ave., No. 249, tenement, 38′ x 67′ 8″; Jas. S. Stone, owner; G. W. Pope, builder.

South Russell St., No. 20, dwell., 21′ 8″ x 40′; E. T. Pollz, owner; J. H. Stevenson, builder.

Winship St., near Washington St., school-house, 67′ 6″ x 27′ and 104′ 8″ City of Boston, owner; Michael Nolan, builder.

Brooklyn.

BUILDING PERMITS. — *Ten Eyck St., No.* 37, n s, 150′ w Leonard St., four-st'y frame tenement, (brick-filled), tin roof; cost, $7,000; owner, Chas. Zellhoefer, 175 South Fourth St.; architect, E. F. Gaylor; builders, Jenkins & Gillies and George Lehrian & Sons.

Manhattan Ave., e s, 145′ s Norman Ave., four-st'y frame store and extension (brick-filled), gravel roof; cost, $6,700; owner, Bridget O'Hare, 145 Green St.; architect, F. Weber; builders, Post & Walker and J. Cashman.

De Kalb Ave., w s, near Hamburgh St., three-st'y frame tenement (brick-filled), tin roof; cost, $4,500; owner, W. R. Ostrander, 209 Keap St.; architect, J. Ireland; mason, Wm. Mead.

St. James Pl., w s, 30′ n Atlantic Ave., 3 three-st'y brick stone-front dwells., tin roofs; cost, each, $6,500; owner, William Moses; architect, A. Hill; builder, J. Stafford.

McDonough St., s s, 162′ 6″ e Tompkins Ave., 4 three-st'y brick and brown-stone dwells., tin roofs; cost, each, $7,000; owner, John Frasler, 16 Rochester Ave.

Manhattan Ave., No. 585, w s, 50′ s Box St., three-st'y frame car-house, etc., gravel roof; cost, $3,500; owner, Cross Town R. R. Co., 585 Manhattan Ave.; architect and contractor, A. L. Chase; builder, G. Strepes.

Seventh Ave., n e cor. Nineteenth St., three-st'y frame tenement, tin roof; cost, $3,500; owner, Owen O'Brien, 874 Sixth Ave., New York; architect, F. Ryan; mason, T. Ryan.

Ten Eyck St., Nos. 24 *and* 26, 2 three-st'y frame (brick-filled) dwells., tin roofs; cost, each, $3,500; owners, A. & C. Brunger, 16 Ten Eyck St.; builders, C. L. Johnson's Sons.

Columbia St., No. 51, 100′ s Amity St., five-st'y brick double tenement, tin roof, metal cornice; cost, $16,000; owner, Mrs. B. Kane, on premises; architects, Parfitt Bros.

Throop Ave., n w cor. Lexington Ave., three-st'y brick store and flats, tin roofs, wooden cornices; cost, $7,000; owner and builder, John McDikken, 282 Marion St.; architect, Ernest Dennis.

Jefferson St., 180′ e Tompkins Ave., 5 three-st'y brown-stone dwells., tin roofs; cost, each, $6,000; owner, S. C. Phillips, 601 Lafayette Ave.; architect, A. Hill.

Madison St., n s, 80′ e Bedford Ave., two-and-a-half-st'y dwell., tin roof; cost, $5,500; owner, John B. Grube, 133 Madison St.; architect, A. Hill.

Humboldt St., e s, 72′ s Meserole St., four-st'y brick tenement, tin roof; cost, $7,000; owner, Theo. Klingelhoefer, Grand and Eighth Sts.; architect, J. Platte; builder, G. Lehrian.

Stockton St., s s, 470′ e Nostrand Ave., 2 frame buildings (brick-filled) one store and tenement, and one tenement, tin roof; cost, each, $4,500; owners and builders, Henry and John Eich, 762 Park Ave.; architect, Th. Engelhardt.

Linden St., s s, 100′ e Bushwick Ave., two-st'y frame dwell., shingle roof; cost, $4,000; owner, A. R. Black, office Brooklyn *Daily Times;* contractor, John C. Sawkins.

Putnam Ave., n s, 255′ e Tompkins Ave., 2 three-st'y brown-stone dwells., tin roofs; cost, each, $8,000; owners, Buckley & Hornby, 890 Gates Ave.; architect, O. Burhaus; builder, W. Wood.

Adelphi St., w s, about 200′ s De Kalb Ave., two-st'y sandstone chapel and Sunday-school, peak slate roof; cost, $11,000; owner, St. Marks Church, Adelphi St.; architect, L. B. Valk; builders, T. Thatcher and E. S. Boyd & Son.

Lafayette Ave., s s, 100′ e Throop Ave., 5 two-st'y brick dwells., tin roofs, wooden cornices; cost, each, $3,000; owner, etc., John K. Bulmer, 213 Adelphi St.

Bedford Ave., w s, 87′ 6″ s Myrtle Ave., two-st'y brick office and salesroom, tin roof; cost, about $6,000; owner, Edwin C. Swift, Lowell, Mass.; architect, J. O'Rourke; builder, B. F. Bailey.

Degraw St., n s, 300′ w Columbia St., 2 four-st'y brick tenements, tin roofs; cost, each, $6,750; owner, John Edwards, 31 First Pl.; architect, Mercein Thomas; builders, Abraham Rutan and Morris & Selover.

Greene Ave., n s, 300′ w Nostrand Ave., 5 four-st'y brown-stone dwells., tin roofs; cost, each, $8,000; owner, William J. Rider, 128 Quincy St.; architect, Amzi Hill.

Herkimer St., n s, 200′ e Howard Ave., 6 two-st'y brick dwells., frame and gravel roofs; cost, each, $3,400; owner and architect, Benj. T. Robbins, Northport, L. I.; builder, E. K. Robbins.

ALTERATIONS.—*Fulton St.*, n w cor. Bedford Ave., add one-st'y, gravel roof; cost, $7,000; owner, Archibald Scott, 186 Flushing Ave.; architect, A. Hill; builders, A. Rutan and Lang & Barnes.

Broadway, Nos. 18, 20 *and* 22, alteration to flat, fronts rebuilt; cost, $12,000; owners, S. Liebmann's Sons, Forrest Ave., near Bremen St.; architect, E. F. Gaylor; builders, Geo. Lehrian & Son and Marinus & Gill.

Chicago.

BUILDING PERMITS:—H. E. Leimbach, two-st'y dwell., 653 Fullerton Ave.; cost, $4,000.

H. Larsen, three-st'y dwell., 223 West Ohio St.; cost, $3,500.

A. Hansen, three-st'y dwell., 95 Centre Ave.; cost, $3,500.

G. Fraja, two-st'y store and dwell., 401 Wells St.; cost, $2,500.

Crane Bros., three-st'y factory, Jefferson St.; cost, $50,000; architect, W. W. Boyington; builders, W. Wills & Son.

S. L. Frazer, two-st'y dwell., 3240 Rhodes Ave.; cost, $5,000; architects, Wheelock & Clay.

J. Seuft, three-st'y store and dwell., 806 Allport Ave.; cost, $3,000; architects, Benes & Sayer.

F. Marrel, three-st'y store and dwell., 845 Ashland St.; cost, $5,000; architects, Benes & Sayer.

R. Knisely, two-st'y shop, 184 South Jefferson St.; cost, $3,000.

E. A. Burdett, three-st'y dwell., 51 Bellevue Pl.; cost, $18,000; architects, Burnham & Root.

C. H. Wells, three-st'y store and flats, Sedgwick and Centre Sts.; cost, $40,000; architect, H. Zirk.

F. Kamentz, three-st'y store and dwell., 943 North Halsted St.; cost, $4,000.

Wm. Maeller, two-st'y dwell., 3112 to 3114 Calumet Ave.; cost, $10,000; architects, Furst & Rudolph.

F. Hesling, two-st'y dwell., 2724 Farrell St.; cost, $2,500.

C. M. Foy, three-st'y dwell., 43 Bellevue Pl.; cost, $10,000; architects, Cobb & Frost.

H. Hardin, three-st'y flats, 448 Thirty-first St.; cost, $8,000; architect, C. Cobb; builder, D. McLachlan.

A. L. Petterson, three-st'y store and flats, 935 West Madison St.; cost, $6,000; architect, W. Pashley; builder, J. Keating.

A. Kolt, three-st'y flats, 343 State St.; cost, $2,500.

Rialto Building, nine-st'y office building, Van Buren and Sherman Sts.; cost, $500,000; architects, Burnham & Root; builders, Mortimer & Tupper.

A. J. Kowslaski, four-st'y store and flats, 615 Noble St.; cost, $9,000; architect, H. Kley.

P. H. Hoffman, three-st'y dwell., 159 West Ohio St.; cost, $4,000.

Mrs. M. Henne, three-st'y store and dwells., 387 to 391 Wells St.; cost, $14,000.

Dr. Byford, 4 two-st'y dwells., 3235 to 3241 South Park Ave.; cost, $15,000; architect, W. A. Thurber.

H. Schaller, two-st'y dwell., 695 to 697 Fullerton Ave.; cost, $6,000.

Mrs. A. Kaiser, two-st'y store and dwell., 84 Thirteenth St.; cost, $4,000.

Blake and Rezabek, two-st'y store and dwell., 598 West Eighteenth St.; cost, $5,000.

F. Enert, three-st'y store and flats, 3108 Halsted St.; cost, $4,000.

Eckhardt & Swan, four st'y warehouse, Canal and Fulton Sts.; cost, $3,200.

Mrs. M. R. Laing, two-st'y flats, 3230 Forest Ave.; cost, $8,200.

A. Haaker, addition, 230 Division St.; cost, $2,500.

B. Moeck, three-st'y store and dwell., 3000 State St.; cost, $12,000; architect, J. Huber.

N. Johnson, two-st'y dwell., 509 Armitage St.; cost, $2,600.

Board of Education, three-st'y school-house, Wallace and Thirty-first Sts.; cost, $49,000; architect, J. J. Flanders; builder, Wm. M. Crilly.

Board of Education, three-st'y school-house, Nineteenth Pl. and Ashland Ave.; cost, $40,000; architect, J. J. Flanders; builder, Wm. M. Crilly.

Board of Education, three-st'y school-house, Thirteenth Pl., near Hoyne Ave.; cost, $49,000; architect, J. J. Flanders; builder, Wm. M. Crilly.

A. Keep, two-st'y barn, Michigan Ave.; cost, $3,500.

J. J. Hallock, two-st'y dwell., 525 Hurlbut St.; cost, $1,500; architect, J. J. Hallock.

Cincinnati.

GYMNASIUM.—The Cincinnati Gymnasium has leased the upper part of the Grand Opera House Building, owned by Mr. David Sinton, and will at once commence operations to make first-class rooms for their purposes. The space to be occupied is 73′ x 78′, and 48′ high; cost, about $15,000; Charles Crapsey, architect.

BUILDING PERMITS.—Mrs. Kruthaup, 2 three-st'y brick buildings, Cutter St., bet. Third and Pearl Sts.; cost, $9,000.

P. Tracy, four-st'y brick building, n e cor. Central Ave.; cost, $8,000.

A. Bauer, three-st'y brick building, Harrison Ave.; cost, $6,000.

Miss Renner, two-and-one-half-st'y brick building, 151 Pleasant St.; cost, $3,000.

Geo. Gould, addition, three-st'y brick building, 232 John St.; cost, $4,000.

Standard Wagon Company, two-st'y brick building, n s Eighth St.; cost, $5,000.

J. Freiberg, three-st'y brick building, n s Ninth St., bet. Baymillar and Preeman Sts.; cost, $7,000.

E. Furst, three-and-one-half-st'y brick building, 55 Clinton St., cost, $6,500.

Theo. Reager, three-st'y brick building, York St.; cost, $3,000.

Mrs. E. H. Ross, two-and-one-half-st'y brick building, w s Beecher St., bet. Lane and Gilbert Sts.; cost, $7,000.

Louis Metz, three-st'y brick building, n s Charles St., bet. Elm and Plum Sts.; repairs and addition costing $4,000.

Total number of permits to date, 302.

Total cost to date, $1,046,500.

Kansas City, Mo.

The stonemasons have met and effected a permanent organization. The object of the organization is simply for mutual protection.

BUILDING PERMITS.—W. A. Kelly, three-and-one-half-st'y brick business block, 507 Walnut St.; cost, $8,000.

Langston Bacon, two brick houses, Holmes St.; cost, $3,000.

W. H. Plum, brick business block, Grand Ave.; cost, $3,500.

G. D. Huling, brick block, 800 Delaware St.; cost, $4,500.

W. C. Lobenstein, brick business block, 561 to 563 Main St.; cost, $30,000.

J. C. Nettleton, block of six brick houses, 912 to 922 East Sixteenth St.; cost, $10,000.

K. S. Rogers, four frame houses, Jefferson St.; cost, $5,000.

Charles Van Evam, brick and stone barn, East Twelfth St.; cost, $7,000.

J. B. Ghio, brick business block, St. Louis Ave.; cost, $6,000.

R. T. Hunt, 6 two-and-one-half-st'y houses; cost, $15,000.

W. M. Masters, brick business block, East Eighteenth St.; cost, $4,500.

T. O. Combs, frame business block, cor. Seventeenth St. and Madison Ave.; cost, $3,000.

R. J. Johnson, frame house, cor. Fifth St. and Lydia Ave.; cost, $3,000.

M. Schoonmaker, brick house, 1723 Jefferson St.; cost $5,000.

Sam W. Gregory, brick house, 1011 Forest Ave.; cost, $5,000.

Seth Mabry, 6 three-st'y brick houses, each 50′ x 58′, cor. Tenth and Central Sts.; cost, $30,000.

J. I. Raynolds, two houses, Penn St.; cost, $2,500.

Cornelius Murphy, brick house, 1103 Cherry St.; cost $3,000.

C. I. Kimmel, house, 1301 Forest Ave.; cost, $5,000.

J. W. Trueworthy, brick house, 1342 East Ninth St.; cost, $5,000.

W. C. Campbell, brick business block, cor. Twelfth and Harrison Sts.; cost, $5,000.

Elmer W. Hines, brick house, Tracy Ave.; cost, $3,000.

Jacob Kirtzman, brick house, 560 Harrison St.; cost, $3,300.

Dr. James B. Bell, two-st'y brick business and residence block, cor. Twelfth and Locust Sts., 132' x 155; cost, $25,000.

Minneapolis, Minn.

BUILDING PERMITS.—J. M. Griffith, two-st'y brick store building, w s Second St., bet. Seventh and Eighth Aves.; cost, $3,000.

Zach T. Mullen, two-st'y wooden dwell. and barn, n s Oak Grove St., bet. Hennepin Ave. and Spruce St., s; cost, $8,000.

Board of Education, cor. Fourteenth St. s and Spruce Pl., three-st'y brick school building; cost, $25,000.

Board of Education, cor. Oak and B Sts., s e, three-st'y brick school building; cost, $25,000.

H. D. Pettibone, two-st'y brick veneer dwell., cor. Seventh St. and Thirteenth Ave., s; cost, $3,500.

George R. Layman, brick store building, n e s Fifth St., bet. Nicolet and First Ave., s; cost, $5,000.

George R. Layman, two-st'y wooden dwell., e s Seven-and-a-half Ave., bet. East Eighteenth and East Nineteenth Sts.; cost, $4,500.

David Tica, two-st'y wooden stores, Western Ave., bet. Twelfth and Thirteenth Sts., n; cost, $4,500.

Hennepin County, repairing court-house, s cor. Eighth Ave. and Fourth St., s; cost, $6,500.

M. T. Tobin, two-st'y brick veneer dwell., e s Eleventh Ave.; cost, $3,000.

H. R. Conary, two-st'y wooden dwells., w s Stevens Ave., bet. East Twenty-eighth and East Twenty-ninth Sts.; cost, $3,000.

W. H. Haight, two wooden dwells., w s Fifth Ave., bet. East Twenty-fourth and East Twenty-fifth Sts.; cost, $3,500.

Mrs. M. J. Bell, two-st'y wooden dwell., w s Chicago Ave., bet. Ninth and Tenth Sts., s; cost, $3,000.

Charles A. Bovey, double two-st'y wooden dwell. and alteration of wooden barn, n s Harmon Pl., bet. Twelfth and Thirteenth Sts., n; cost, $8,250.

Lyman Bros., two-st'y brick addition to building, 421 Nicollet Ave.; cost, $3,500.

Union Elevator Company, wooden grain elevator, n e s St. Paul, Minneapolis & Manitoba Railway track; in sec. 19, town 29, range 23; cost, $250,000.

L. M. Lane, two-st'y wooden dwell. and barn, s w s Sixth St., bet. Second and Third Aves., s; cost, $3,700.

L. M. Lane, double two-st'y wooden dwell. and barn, s w s Sixth St., bet. Second and Third Aves., s; cost, $4,000.

Philadelphia.

BUILDING PERMITS.—*Twenty-fourth St.*, n of Brown St., 20 three-st'y dwells., 17' x 58' 6"; Jno. M. Sharp, owner.

Twenty-fourth St., n of Brown St., 8 three-st'y dwells., 20' x 55'; owner, same as last.

Ringgold St., s of Parrish St., 9 two-st'y dwells., 16' x 40'; owner, same as last.

Goodman St., below Westmoreland St., two-st'y dwell., 16' x 44'; Jos. Smith, owner.

Catharine St., w of Broad St., three-st'y dwell., 18' x 62'; Thos. Little, contractor.

Seventeenth St., s of Master St., three-st'y store, 18' 6" x 60'; P. H. Somersett, contractor.

Kirkbride St., cor. Richmond St., two-st'y store, 18' x 60'; Amos W. Linn.

Manton St., w of Twenty-first St., 9 two-st'y dwells., 14' x 35'; Jno. McConaghy, owner.

Hancock St., n of Lehigh Ave., two-st'y dwell., 17' x 43'; Chas. Booth, contractor.

Hancock St., n of Lehigh Ave., two-st'y office, 18' x 56'; contractor, same as last.

York Road, three-st'y dwell., 29' x 38'; W. R. Brown.

York Road, two-st'y stable, 22' x 32'; W. R. Brown.

Wharton St., cor. Ward St., one-st'y shop, 18' x 40'; D. McGettigan, owner.

Wharton St., *Nos.* 3224 *and* 3226, 2 two-st'y dwells., 16' x 28'; Thompson Bros., contractors.

Passayunk Ave., w of Schuylkill Ave., two-st'y machine-shop, 59' x 120'; also, one-st'y boiler-house, 57' x 120'; owner, Atlantic Refining Co.

Twenty-fifth St., above Brown St., 19 two-st'y dwells., 16' x 57'; I. H. Lyons, owner.

Twenty-fifth St., above Brown St., 10 three-st'y dwells., 18' x 57'; I. H. Lyons, owner.

Page St., above Twenty-ninth St., 8 two-st'y dwells., 13' x 36'; W. H. Thompson, owner.

Berks St., above Twenty-first St., 8 two-st'y dwells., 15' x 44'; J. L. Carre, owner.

Main St., between Chestnut and Summit St., two-st'y dwell., 26' x 27'; G. S. Pott, owner.

West Johnson St., *No.* 45, three-st'y dwell., 45' x 70'; C. R. Kohl & Bros., contractors.

Manheim St., w of Twenty-first St., 10 two-st'y dwells., 14' x 35'; Jno. McConaghy, contractor.

New York.

THE NEW BUILDING LAWS.—The new building laws do not appear to give universal satisfaction, and some action will be taken to prevent them being signed by Governor Hill.

ASSOCIATION BUILDING.—For the Young Women's Christian Association, a five-and-a-half-st'y brick and stone building, 75' x 102', is to be built on the n s of Fifteenth St., 100' e of Fifth Ave., from plans of Mr. R. H. Robertson, to cost $90,000.

CLUB-HOUSE.—At Nos. 60 and 62 Pine St., and Nos. 22 and 24 Cedar St., a five-st'y club-house, 44' x 134', is to be built for the Down-Town Association from plans of Mr. C. C. Haight.

CONTRACTS.—A large number of contracts have lately been signed for buildings previously reported; the labor question having been settled, figures are pretty close.

FACTORY.—The United States Illuminating Company will build a factory on a lot, 100' x 125', at the foot of Twenty-ninth St. and East River.

BUILDING PERMITS.—*West Fourth St.*, *No.* 151, six-st'y brick tenement, tin roof; cost, $15,000; owner, Walden Pell, 10 East Thirtieth St.; builder, C. E. Hadden.

Franklin St., s e cor. West St., 6 two-st'y brick stores, four on Franklin St. and two on West St.; total cost, $20,000; attorney for owner, Fred. Clarkson, 54 Wall St.; architect, Daniel Burgess; builders, D. & E. Herbert and Egbert Mills.

Tremont Ave., n s, 25' e Daly Ave., two-st'y brick engine-house (No. 45), shingle roof; cost, $10,000; owner, City of New York Fire Department, 155 Mercer St.; architects, N. Le Brun & Son.

Charles St., s s, 75' w Washington St., seven-st'y brick, fire-proof malt-house, asphalt roof; cost, $48,000; owners, Beadleston & Woerz, 291 West One Hundredth St.; architects, A. Pfund & Son.

Tenth St., n s, 108' w Washington St., seven-st'y brick, fire-proof storage-building, asphalt roof; cost, $10,000; owner and architect, same as last.

Stanton St., *No.* 242, five-st'y brown-stone front tenement, tin roof; cost, $18,000; owner, Michael Fay, 416 East One Hundred and Twentieth St.; architects, A. B. Ogden & Son.

Stanton St., *No.* 249, five-st'y brown-stone front tenement; cost, $16,000; owner and architect, same as last.

Suffolk St., e s, 100' s Stanton St., 4 five-st'y brick tenements and stores, tin roofs; cost, $20,000 each; owner, etc., J. P. Murray, 315 East One Hundred and Sixteenth St., and Chas. Ruff, 18 Hester St.; architect, J. H. Valentine.

Wall St., *Nos.* 8, 10 *and* 12, and *Pine St.*, *Nos.* 7 *and* 9, eight-st'y and attic brick fire-proof office-building, slate and asphalt roof; cost, $500,000; owner represented by J. J. Astor, 388 Fifth Ave.; architect, H. J. Hardenbergh.

Delancey St., *Nos.* 240, 242, 244 *and* 246, 4 five-st'y brick tenements, tin roofs; cost, total, $64,000; owner, S. Langfelder, 85 East Broadway; architect, Chas. Rentz.

Grand St., *No.* 74, five-st'y brick store, tin roof; cost, $30,000; owner, Ambrose Kingsland, 55 Broad St.; architect, Geo. W. da Cunha.

Madison St., n s, 100' e Catharine St., five-st'y brick tenement, tin roof; cost, $12,0000; owner, Mary J. Lancer, 51 Oak St.; architect, Ernest Dennis; builder, John G. Porter.

Eleventh Ave., *No.* 426, five-st'y brick tenement, tin roof; cost, $18,000; owner, Thos. Muller, Flushing, L. I.; architect, C. F. Ridder.

St. Louis.

BUILDING PERMITS.—Sixty-six permits have been issued since our last report, sixteen of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows:—

St. Louis Mutual House-Building Co., No. 3, two-st'y brick dwell.; cost, $3,000; E. Mortimer, architect; J. H. Dunlap, contractor.

George Heerich, two-st'y brick dwell.; cost, $5,600; Gunnewald & Wind, contractors.

Joseph Dormitzer, 3 adjacent one-st'y stores; cost, $3,000; F. C. Bonsack, contractor.

G. Kingsland estate, one-st'y brick store; cost, $4,500; Pombiray, architect; S. Robbins, contractor.

Mrs. Sair, 5 adjacent two-st'y brick dwells.; cost, $9,500; A. Garble & Co., architects; A. E. Cook, contractor.

Jno. J. Thompson, two-st'y brick dwell.; cost, $2,500; Jno. S. Thomas, contractor.

Dr. S. C. Cabanne, two-st'y brick dwell.; cost, $6,000; J. Cudmore & Bro., contractors.

F. B. Hauck, four-st'y brick store; cost, $15,000; H. E. Peipers, architect; contract sub-let.

Wm. H. Young, two-st'y brick dwell.; cost, $2,500; Pritchett & Moore, contractors.

M. D. Thompson, three-st'y store and offices; cost, $3,000; J. P. Evans, contractor.

Chas. Timmerberg, 2 adjacent two-st'y brick stores and tenements; cost, $6,000; A. Beinke & Co., architects; R. J. Loyd, contractor.

Green Tree Brewery Co., three-st'y brick brewery and malt house; cost, $20,000; J. Jungenfeld & Co., architects; contract sub-let.

Jno Quast, two-st'y brick dwell.; cost, $3,800; H. Ellermann, contractor.

St. Paul.

BUILDING PERMITS.—Two-st'y frame dwell., n s of Laurel Ave., bet. Western and Arundel Sts.; cost, $4,600; owner, C. W. Kibby.

Three-st'y brick veneer stores and dwells., w s of Mississippi St., bet. Glencoe and Mississippi Sts.; cost, $8,500; owner, John Kreener.

Two-st'y brick double dwell., e s of Minnesota St., bet. Tenth and Eleventh Sts.; cost, $6,000; owner, Christopher Ritcher.

Two-st'y frame dwell., w s of Josette St., bet. Nelson and Iglehart Sts.; cost, $2,450; owner, Mrs. E. J. Mott.

Two-st'y brick veneer store and dwell., s w s of Wabasha St., bet. Aurora and University Sts.; cost, $3,600; owner, W. Achterling.

Two-st'y frame double store and dwell., e s of Seventh St., bet. Arcade and Minnehaha Sts.; cost, $2,400; owner, J. G. Elinquist.

2 two-st'y frame dwells., n s of Yale St., bet. St. Albans and Grotto Sts.; cost, $2,200; builder, S. T. Bennett.

One-st'y frame dwell., w s of Burr St., bet. York and Case Sts.; cost, $1,800; owner, H. B. Sweet.

Two-st'y frame dwell., w s of Kent St., bet. Carroll and Iglehart Sts.; cost, $3,000; owner, E. C. Varney.

Three-st'y brick block stores, n s of Sixth St., bet. Jackson and Sibley Sts.; cost, $16,000; owner, R. R. Nelson.

Two-st'y brick dwell., n s of Iglehart St., bet. St. Peter and Wabasha Sts.; cost, $5,200; owner, J. F. Williams.

General Notes.

BEAVER FALLS, PA.—Dwell., for E. D. Dudwig, Esq.; cost, $4,000.

CATONSVILLE, MD.—Theodore Lurman, Esq., is to have built a basement, two-st'y and attic dwell., brick and frame, 36' x 36', to cost $6,000, from designs by J. A. & W. T. Wilson, architects, Baltimore.

GOVANSTOWN (Baltimore Co.), MD.—Jas. G. Wilson, Esq., is making alterations, to cost $2,000, from designs £q J. A. and W. T. Wilson, architects, Baltimore.

GREENVILLE, PA.—Three-st'y store and dwell.; cost, $12,000; Caldwell & Clift.

Reform Church, two-st'y; cost, $13,000.

W. H. Findley, Esq.; Dwell.; cost, $4,000.

D. C. Meyer, Esq., brick dwell.; cost, $3,200.

ILLCHESTER (Howard Co.), MD.—Robert Mitchell, Esq., is to have built a two-st'y and attic frame house, 42' x 60', to cost $12,000; and a frame tenement-house and stable, to cost $2,500, from designs by Messrs. J. A. & W. T. Wilson, architects, Baltimore.

MIDDLETOWN, O.—Mr. P. J. Sorg is to build a first-class residence; cost, $40,000; Mr. S. Hannaford, of Cincinnati, architect.

MT. WASHINGTON (Baltimore Co.), MD.—David Baldwin, Esq., is to have built a two-st'y and attic frame dwell., 35' x 40', to cost $5,000, from designs by B. B. Owens, architect, Baltimore; R. Vinton Blake, builder, Mt. Washington.

NEWCASTLE, PA.—Y. M. C. A., three-st'y pressed-brick and stone library-building for Ira D. Sankey, Esq., Brooklyn, N. Y.; cost, $24,000.

Dwell. for E. J. Agnew, Esq.; cost, $7,000.

Two dwells., for A. W. Thompson, Esq.; cost, $6,800.

Dwell. for C. H. Dunlap, Esq.; cost, $3,800.

Dwell. for Mrs. M. I. Foulk; cost, $2,000.

Dwell. for M. H. Allexander; cost, $1,700.

Dwell. for D. I. Comble, Esq.; cost, $3,000.

Dwell. for Mrs. E. Dunlap; cost, $3,200.

Skating-rink for E. M. Richardson, Esq.; cost, $4,450.

Skating-rink for R. M. Allen, Esq.; cost, $5,200.

NEW WILMINGTON, PA.—Brick church, one-st'y; cost, $10,000.

PONTIAC, ILL.—There is to be a church built in Pontiac, to cost $13,000 or thereabouts, by the Methodist people.

RELAY HOUSE (Howard Co.), MD.—Edward Murray, Esq., is to build a two-st'y and attic stone dwell., to cost $12,000, from designs by J. A. & W. T. Wilson, architects, Baltimore.

ROCHESTER, N. Y.—Mortimer F. Reynolds, of Rochester, has given $25,000 to the University of Rochester, for a chemical laboratory, as a memorial of his brother, William A. Reynolds, who was a member of the Board of Trustees.

The Genesee Brewery, lately destroyed by fire, has been rebuilt; Oscar Knebel, architect.

Work on a four-st'y building, cor. East Ave. and Union St., has just been commenced; building to cost $20,000; Jno. Straughen, contractor; Hiram Davis, owner.

The property cor. Central Ave. and North St. Paul St. has just been purchased by Henry Bartholomay, President of the Bartholomay Brewing Co., who intend erecting a large fire-proof hotel.

The Company have also purchased land on Marietta St., on which to erect their bottling works.

SHARON, PA.—Dwell.; cost, $30,000; J. H. Elliott, Esq.

Bids and Contracts.

KANSAS CITY, MO.—The Secretary of the Treasury has awarded the contract for gas-fixtures in the public buildings at Kansas City and Memphis to R. Hollings & Co., of Boston.

HUDSON, N. Y.—The Board of Managers of the proposed House of Refuge for Women, to be erected at Hudson have awarded the contract for constructing the building to John Moore, of Syracuse, for $86,065. The building is to be fire-proof, and will be 49' x 110', covering a ground space of 5,300 square feet.

ROCHESTER, N. Y.—Contracts for the Kirby Building, on East Main St., have been let to McCormick & Hotchkin, for $28,000; building to be completed by November 1, 1885.

Also, contracts for a building for E. F. Woodbury, cor. North St. Paul and Mortimer Sts., 65' x 155' of brick and stone, let to Gorelline & Boyd, contractors; Warner & Brockett, architects; building to cost $50,000; to be completed October 1, 1885.

Contracts will be let very soon for a business building on Main St., opposite the Arcade, for Jno. H. Hill, Esq., to be built of stone and copper; Warner & Brockett, architects.

PROPOSALS.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS.

THERE is a certain monotony about the accounts of the burning of city factories. So many of them have been destroyed, and so many lives lost in them, that we are able to predict with tolerable certainty the modes in which the buildings will take fire, the course of the flames, the character of the frantic efforts which the imprisoned operatives will make to save themselves, and their fate. The last example, differing in some respects from the ordinary ones, occurred in Cincinnati, where a printing-office took fire, and, although the building was saved with little damage, fifteen persons lost their lives within as many minutes after the fire began. The immediate cause of the catastrophe was the explosion of a can of benzine in the second story of the printing-office. As usual, the flames immediately darted up the elevator-shaft to the top story, where a large number of girls were employed in folding. The only staircase to this story was built around the elevator-shaft, separated from it by an open wooden lattice, which of course caught fire like tinder, making the stairs impassable. One brave man, John Sullivan, whose name deserves long remembrance, ran up the stairs at the first alarm, to warn the helpless girls, but he had hardly reached the top of the staircase before it blazed up behind him, cutting off his retreat. Without troubling himself about this circumstance, he set himself to saving the lives of those whom he had come to warn. Four of the girls had already jumped from the window, and were lying, dead or maimed, on the sidewalk below, but the occupants of the adjoining building had been sensible enough to carry a long rope to the roof, which they lowered within reach of a window in the room where the poor wretches were imprisoned. Sullivan caught the rope, and tied one of the girls to it, and the men on the roof lowered her safely to the sidewalk, and drew it up again. Another girl was lowered in the same way, but the room was by this time so full of smoke that respiration was impossible, and when the rope was pulled up for the third time Sullivan was the only person left alive there. He tied the rope about himself, and was lowered a part of the way, when a tongue of flame issued from a window above him, and struck the rope, burning it off; and he fell, striking his head on the sidewalk, and dying instantly. By this time the engines had arrived, and the fire was so soon under control that in fifteen minutes after the call for help was given the chief engineer was able to ascend, by the still serviceable stairs, to the upper story, where ten young girls lay dead upon the floor and on the tables. Above them was an open scuttle, by which they could easily have escaped over the roof to the adjoining buildings, if they could have reached it; but there was no ladder, and they were too much terrified to build steps of tables and benches, even if they could have seen well enough through the blinding smoke to do so within the few minutes that life remained to them.

THE New York *Graphic* tells an interesting story about the life of Mr. F. A. Peterson, an architect well known among the older members of the profession, who died in New Jersey a few days ago. Mr. Peterson, according to the account, was born in Prussia in 1808, and was educated for the army. While stationed, as a lieutenant of engineers, on the staff of the general commanding the Dantzic district, an inundation took place, and Lieutenant Peterson was sent to the spot to render what assistance he could. He found the water rising rapidly, and a small town in momentary danger of being overwhelmed. A dyke protected the town from the sea, and on comparing the relative levels on each side of the dyke, he ascertained that by cutting the dyke the water of the inundation would escape safely into the sea. Without waiting to make further inquiries, the young engineer ordered this to be done, and in a few hours the flood had been safely drained away. The inundated ground had, however, been hardly dried by the sun before the ungrateful inhabitants of the town which the energetic young officer had saved brought suit against the Government for damages for the cutting of their dyke, claiming a hundred thousand thalers as compensation, under an old law which, for the protection of the dykes, had made it a crime, punishable with the cutting off of the right hand of the offender, as well as with the payment of pecuniary indemnity, to make a breach in them. A military commission was sent to inquire into the matter, and found that the law had never been repealed, and that no exception was made in it in favor of cases of necessity; and it therefore recommended that the indemnity should be paid. The villagers were good enough not to demand that the hand of the man who had saved their lives and property should be chopped off, and the military commission having warmly praised his energy and skill, he was promoted, and soon afterwards was attached to the royal staff. While holding this position he was sent repeatedly to England, and there imbibed notions of popular government, which finally led him to an avowed sympathy with the revolutionists of 1848, and he was arrested, and thrown into prison to await trial. Fortunately, with the help of his wife and a few friends, he managed to escape from prison, and gained the shelter of an American ship, which brought him to New York. Here he began business as a civil engineer and architect, and was entrusted with many commissions of considerable importance, his best-known building being perhaps the Cooper Institute, at the junction of Third and Fourth Avenues and the Bowery.

THE telegraph brings news of the death of Théodore Ballu, one of the most distinguished of French architects. According to the dictionaries of contemporaneous biography, on which we must rely for information until further details come to hand, M. Ballu was born in Paris in 1817, and entered the School of Fine Arts in 1835. After five years in the school he won the Prize of Rome, and on his return from his five years of study in Italy and Greece, was appointed inspector of works at the church of Sainte Clothilde, and was for many years connected with that building. Like Viollet-le-Duc, he was an archæologist and restorer as well as an architect, and distinguished himself by his restorations of the curious transition church of Saint Germain l'Auxerrois, and the tower of Saint Jacques la Boucherie. His principal original works were the churches of la Trinité and St. Ambroise, and the new Hôtel de Ville of Paris, which, in association with M. Deperthes, he rebuilt upon the ancient site, and very nearly in the original style. After the death of Viollet-le-Duc in 1874, he was chosen to fill his place as Inspector of Diocesan Buildings, and continued to enjoy the highest favor with the Government to the end of his life. In the profession he was greatly esteemed, and in 1872 was elected to the Academy.

LE GENIE CIVIL gives a curious account of the work for the foundation of the great church of the Sacred Heart at Montmartre. This church, the design of which is due to the late M. Abadie, who was selected as architect in the memorable competition of 1874, stands on a gravelly hill in the suburbs of Paris, and the construction being intended to be very solid it was necessary to take special pains to secure a substantial foundation. The preliminary excavations showed that the upper stratum of soil on the hill consisted of sand, to a depth of about thirty feet, but it was not considered safe to place the building on this, and trial pits were sunk at different points, which showed that the sand rested on successive layers of clay and gravel, extending far below the surface, and reposing at last on a compact mass of gypsum rock. Although the rock was one hundred and fourteen feet below the surface, it was deemed imprudent to trust the weight of the huge, stone-roofed church on any of the strata above it, and the entire foundation was therefore carried down to this great depth. The plan of the building, like that of most stone-vaulted churches, presenting

a series of piers, carrying most of the weights, with nothing but thin curtain-walls between, it was only necessary to build the piers up the whole distance from the rock, leaving the curtain-walls to be carried by arches turned between the foundation-piers a little below the ground. The whole number of piers built up from the rock was eighty-three, the size on plan varying from ten to seventeen feet square. Before commencing the masonry, a drill-hole was sunk to a depth of twenty-two feet in the rock below each pier, to see whether galleries from any of the numerous gypsum mines in the neighborhood had been run under it, but the rock proving sound everywhere, the piers were built directly upon it, of rubble stone-work, the first six feet being laid in cement, and the rest in hydraulic lime. The whole amount of stone-work laid in the piers was about one and one-quarter million cubic feet, and just below the floor of the crypt all the piers were connected with arches and vaults, upon which the pavement of the crypt was laid, and the superstructure was then commenced upon the foundation so secured. The work above ground has proceeded rapidly, and the crypt is now completed, and the walls of the upper church so far advanced as to permit the western porch to be vaulted and covered with its stone roof-tiles, and the apsidal chapels to be terminated, with the exception of the Lady Chapel, which is to be carried up into a high tower. Since M. Abadie's death M. Daumet has directed the execution of his design, and M. Raulin, whom some of our younger readers will remember as a fellow-student with them in Paris, has had charge of the work on the ground.

A BRIDGE of concrete, thirty-three feet in span, and carrying a roadway thirteen feet wide, and capable of supporting safely a load of two hundred tons, was recently built in Switzerland in a single day, under the direction of Professor Tetmaier of Zurich. According to *Le Génie Civil*, the bridge was a single arch, of segmental profile, rising six feet and a half from springing to crown, and twenty inches thick at the crown, and forty at the springing, with abutments ten feet thick. The concrete used for the arch was composed of one part cement, mixed dry with two parts sand, and the whole then mixed with four parts of gravel, and water enough to cause a light sweating as the concrete set. For the abutments, three parts of sand and seven of gravel were used to one of cement. All the materials were made ready beforehand, and at six o'clock in the morning the construction of the abutments was begun. As soon as these were brought to the proper height, the centre was set in place, and the arch turned, and tympanum walls built up on each face of the arch, to the level of the roadway. Gravel was then filled in over the arch, between the tympanum walls, to the roadway level, and the bridge was pronounced finished, the whole work having been completed in twelve hours, at a cost of six hundred and four dollars, including the expense of an iron railing on each side. It would have been foolish to permit vehicles to pass over the bridge at once, and two months were allowed for the hardening of the concrete, after which a heavy traffic immediately began, without any apparent injury to the construction.

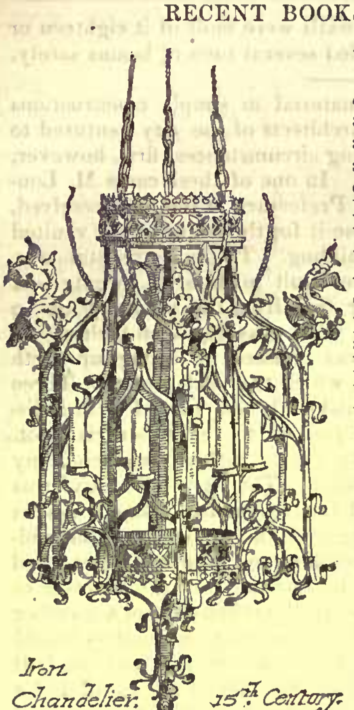
THOSE persons who live near great iron-works, and who wish to build substantial but cheap structures, may derive useful suggestions from a paper read before the French Société Centrale des Architectes, upon concrete construction, as practised at Lyons, with cinders for the aggregate. The first experiments in the use of this material were made about thirty years ago by some builders who had hired land by the river-bank, and wished to find a material for their walls as cheap as the *pisé*, or consolidated loam, which is much used in Southern France for low structures, but less liable to washing away in case the river should overflow its banks. At that time coal cinders were a waste product in Lyons, as they still are in many towns, and the proprietors of the foundries were glad to give them away, either for nothing or at a price of a cent or so a cubic foot. The surface of the cinders is so rough as to adhere strongly to any concreting substance, and even with pure lime, in the proportion of one part lime to four of cinders, a concrete was obtained which presented a considerable resistance, and with hydraulic lime a very efficient concrete was produced. The success of the first experiments attracted attention, and the new concrete soon came into extensive use for walls, which could be made of it, so long as cinders could be had for the asking, at a cost of less than three cents a cubic foot. By the substitution of hydraulic lime for the common sort in the concrete, its quality was greatly improved, and walls were built of it eighteen or twenty inches thick, which carried several tiers of beams safely.

THE good quality of the material in simple constructions being thus shown, some architects of the city ventured to employ it under more trying circumstances, first, however, subjecting it to thorough tests. In one of these cases M. Louvier, the architect of the new Prefecture in the city, resolved, if it should prove suitable, to use it for the whole of the vaulted ceiling over the cellar of his building. To try its resistance in such a situation, he had a barrel-vault made of it, twenty feet in span, and rising about four feet from the springing to the crown. The thickness of the vault was eighteen inches, and what thrust it might have was resisted by piling up earth against the low stone walls on which the vault rested. Three weeks after the vault was finished it was loaded with a distributed load of five hundred pounds to the superficial foot. This load was left on it for two weeks, without producing any settlement or rupture of any kind. The distributed load was then removed, and a weight of twelve hundred pounds was let fall, from a height of something over three feet, upon the middle of the vault. This shock produced no injurious effect; and a third test was made, to try the resistance of the concrete to fire. This was done to remove the apprehensions of a member of the municipal council, who thought that the cinders would make the mass combustible. A bar of iron, two and one-half inches square, was fastened under the soffit of the vault, and a movable forge was so placed that the blast could be directed upon it. The forge was then lighted, and the iron bar, with the concrete about it, kept at a "red-white" heat for half an hour. After it had cooled no effect could be perceived from the flame except a superficial calcination of the concrete; and a load of six thousand pounds was then placed on the top of the vault, which endured it without the least fracture or yielding. The extraordinary capacity of cinder-concrete for resisting fire is well known in this country, but it is interesting to find such confirmation as this of the American opinion of its good qualities. In fact, it is said that a manufactory of nitro-benzol, in the suburbs of Lyons, which had walls of cinder-concrete, took fire, and burned so furiously that the machinery was partially melted. The walls were vitrified in places by the heat, but were otherwise uninjured, and the new floors and roof were, in rebuilding, put in the same places that the old ones had occupied.

AN exhibition of process and manufactured goods, carried on by private enterprise, is to be held in Paris this year, in the Palais d'Industrie. Although a small affair in comparison with the great Exposition of 1889, it is likely to have, like most well-managed small exhibitions, an interest of its own, and as the building in which it is to be held is near the Tuileries, and therefore quite centrally situated, it is likely to attract many casual visitors. The space is limited, and as the affair is not a public one, a charge is made for space, installation and representation, which will probably restrict the number of foreign exhibitors very materially, as those only are likely to incur the cost of exhibiting who are sure of being reimbursed through the advantage afforded by the opportunity of introducing their goods to the public on the other side of the ocean. If any such should happen to be among our readers, we may save them trouble by saying that Mr. Jacob Sommer, 13 Laight Street, New York, is the proper person to apply to for further information; and any others who are likely to be in Paris between the twenty-third of July and the twenty-third of November will do well to remember that an interesting exhibition will, between those dates, be in progress in a very pleasant and accessible quarter of the city.

WE do not doubt that many of our readers, particularly those who practise far from the great cities, will be glad to know the method of preparing the tracing-paper which they find so indispensable to their work. According to the *Scientific American*, nothing more is necessary than to lay sheets of tissue-paper on a flat board or table, and sponge them on one side with a solution of two pints of Canada balsam in three pints of spirits of turpentine, to which a few drops of old nut oil have been added. The paper, after treatment, is to be hung up to dry, over two cords, stretched eight inches apart, and finally rolled up on rollers covered with paper. When the composition has dried so as to be no longer sticky, the paper is ready for use.

RECENT BOOKS ON ART.



Iron Chandelier. 15th Century. National Museum, Germany.

A POINT of view which is not moral, literary, or vaguely "æsthetic," but is primarily artistic, looking at art as art, and at painting as painting; a sympathy which takes in not only the old masters and modern English art, but modern Continental art as well; and a style which is clear, precise and lucid — these are qualities we have only of late years learned to expect in criticism that comes from an English hand, qualities we have felt to be rather French than British. To-day, however, there are many English writers who exhibit them, and among these writers Mr. Carr holds one of the foremost places. And his criticism is apt to show, in addition, a deep feeling (sometimes missing from current French work) for those intellectual, poetic, spiritual factors which should underlie painting, although they cannot *make* painting. It is no easy task to hold the balance true between what is spiritual in art and what is technical — or rather, to weigh both together, with justice and appreciation; but it is a task within Mr. Carr's ability, and the only regret his book[1] inspires is that, with its large print and wide margins, it offers us a more slender meal than we had anticipated from our first glance at its covers. The two chapters on Reynolds and Gainsborough are written with such keen insight and delicate skill of expression that they are very valuable, in spite of the well-worn nature of their themes. And we have an unusual degree of confidence in their decisions, because, as I have implied, no one can accuse this admirer of being insular in his admirations.

The greatest worth of the book lies, I should say, in the sketch it gives in these two essays — in one on James Barry, and in one on Rossetti — of the general course of English art. The sketch is slight and is incidental to the titular subject-matter, but its clearness and breadth are only the more remarkable, and they prove that, in studying any special artist, Mr. Carr studies him, not (as is too often done) as a figure of isolated interest, but as part and parcel of a wider whole. No surer test than this, I think, can be applied if we would estimate the value of a critic's judgments.

A fifth chapter, the longest of all, is devoted to a collection of drawings by the old masters. Here again the insight is keen, the temper is catholic, and the words are excellently well chosen. But we note in one or two places that Mr. Carr either does not know or does not accept the latest decisions of German criticism — that criticism which is so valuable as to facts of origin and authenticity, although often much less valuable as to other matters. For instance, Mr. Carr refers to the famous sketch-book at Venice as authoritative with regard to the parentage of other drawings attributed to Raphael. But many German students (led by Morelli, who is an Italian, but who writes in German, under the pseudonym of Lermolieff) now believe the drawings of the sketch-book to be chiefly Pinturicchio's, and but two of them to be Raphael's. Only doctors are privileged even to disagree upon such questions. But it is certain that the internal evidence to which Lermolieff appeals is the sole evidence which can be accepted in deciding upon the authorship of the sketch-book, and, in consequence, of numerous other drawings and paintings which were made either by Raphael or by his fellow-workers. Its extrinsic claims to Raphael's authorship are so very slight that the only wonder is that the discussion which now has been started should not have been started long ago. The proven pedigree of the book goes back much less than a century; the owner who revealed it to the public christened it in a first burst of uncritical enthusiasm, and neither he nor any one else seems to have reconsidered the matter until Lermolieff came upon the scene a few years ago. His book ("*The Works of the Italian Masters in the Galleries of Munich, Dresden and Berlin*") is much broader in its scope than its title implies. It has been successfully revolutionary upon many very interesting and important points, and I think the point with regard to the Venetian sketch-book is now pretty generally included in the list.

This little book,[2] one of the latest issues in the excellent "*Bibliothèque de L'Enseignment des Beaux Arts*," well meets a want that ought to be very widely felt. The larger portion of what is really practical and instructive in the way of art criticism, and especially of the criticism of architectural art, must remain a sealed book to those who do not read French. So true is this that I cannot conceive of any acquirement more essential to an earnest student than the acquirement of French. After the first steps have been taken, a prime necessity will be a dictionary giving clear explanations of technical and semi-technical terms. This is what we now have in M. Adeline's volume, and, fortunately, in a very portable form and at a very cheap price, four francs fifty centimes. Intended for French students, its explanations are of course in French; but for this reason they are more sure to be trustworthy than are those in French-English lexicons, and the educational value of the book will be all the greater to the student. If his comprehension remains at fault, moreover, he will almost certainly be helped out by an illustration, for the entries, which number about five thousand five hundred, are accompanied by no less than fourteen hundred cuts. These cuts are very small, but in general very business-like and clear and very well selected.

It is not often left for a foreigner to decide whether or no there are mistakes in the text, but even a foreigner can decide whether there are omissions or shortcomings. I have searched for such with the conscientious eye of a reviewer. To say that I have found some is merely to repeat what we all know, that there never has been and never will be a dictionary, lexicon, encyclopædia, or book of reference of any kind which even the least conscientious of reviewers could call perfect. But as the standard in such things goes, M. Adeline's book seems to me to deserve great praise. In short, I can hardly recommend it strongly enough to my readers, for I know of none other whatsoever which (especially when we remember price and size) could be cited as a rival. I may add that a wise latitude has been allowed in the choice of subject-matter; not only the main arts but all the handicrafts find a place, and such accessory sciences as, for example, photography, anatomy, and heraldry. Nor are the explanations simply etymological. They are briefly and crisply, but very instructively critical and historical as well. Once, at least, I have also found a bit of hopeful prophecy, as may be read in the following translation of the paragraph that stands under the heading "*Lighthouse:* — Used of those towers, turrets, or tall, slender structures which are erected on the seacoast or on the shores of wide rivers, and bear upon their summits lights for the guidance of the navigator. At the entrance of the ports constructed by the Romans there were often towers serving as lighthouses, and built in imitation of that celebrated *Pharos* of Alexandria, which, recalling the apothesis-pyre, was formed of truncated pyramids placed in retreat, one above the other. Sometimes, again, colossal figures are used as lighthouses. Such was the Colossus of Rhodes, and such will be, in America, the statue of Independence (*sic*) by Bartholdi, executed in *repoussé* bronze; its highest point being destined to receive a beacon."

Few, indeed, of all the very many recent writers upon art have deserved so large a meed of gratitude as Charles Blanc.[3] The field he covered was very wide, and he brought to its survey theories which were consistent and logical from end to end, yet were preserved from narrowness by his widely sympathetic nature, and from vagueness by his intense appreciation for the technical side of art. That is to say, his writing combines to a most unusual degree the qualities of good art-philosophy and of good art-criticism. Moreover, he wrote with a distinct educational aim in view, and his works have thus a peculiar value to the student as opposed to the mere lover of art or of literature. The lover of literature too, however, must hold Charles Blanc in peculiar honor, for there is little writing, even in that language which is peculiarly rich in such, that as writing proper is more admirable than his, more forcible, more finished, or more exquisite. To the student his "*Arts du Dessin*" and his "*Arts Décoratifs*" are absolutely indispensable manuals. And it is well when their teachings can be supplemented by a knowledge of that great work on the painters of all ages, in which Charles Blanc was helped by other pens, though the guidance of the whole scheme and much the larger portion of the text remained in his own hands. But even the student who owns and reads and values these books will be helped by a perusal of the volume here under consideration. It notes the main facts of the great critic's life without any pretence to biographical completeness, but yet in a way which makes us acquainted with a charming personality, and affords an inspiring lesson as to how an earnest worker may regulate his existence, conceive of his task and pursue his aims with a single-mindedness, a devotion, and a self-sacrificing enthusiasm that cannot be overpraised. And it gives an analysis of his views upon each department of art as they are set forth in his voluminous pages: an analysis which is a most valuable guide either to prepare one for the books themselves or to systematize their contents in the memory after they have been read. Not less instructive and with more of essential novelty is the chapter which reviews the course of French criticism previous to Charles Blanc's day.

The introduction consists of an estimate of Charles Blanc's writings, and of his services as a teacher, which first took shape as the inaugural address delivered by M. Eugène Guillaume to the students of the College de France, when he was appointed to fill the chair of æsthetics left vacant by the death of Blanc. The foundation of this chair, I may note, was largely due to the energy of Charles Blanc himself, and it is not one of the least of the benefits for which art is indebted to her great critic.

Every one knows how very much has been written by Frenchmen

[1] *Papers on Art.* By J. Comyns Carr. London: Macmillan, 1885.

[2] "*Lexique des Termes d'Art,*" *par Jules Adeline.* Paris: Quantin.

[3] "*Charles Blanc et son Œuvre,*" *par Tullo Massarani. Avec une Introduction par Eugène Guillaume.* Paris: Rothschild, 1885.

about the art of modern France; yet one might be at a loss where to turn for a compact and consecutive treatise which should present the whole story in a clear and impartial light. I think, in fact, that no volume exists in French or English which quite holds the place held by the new German book[1] I cite. Several similar books exist in the same language, but none of them is to be compared to this in width and minuteness of knowledge, or in lack of Teutonic prejudice, of Teutonic philosophico-æsthetic theorizing, and of Teutonic infelicities in arrangement and in style. In these latter points, and indeed in all points, the author seems to me to show that he has studied to good advantage the writers as well as the artists of France.

This volume is but the first of a series which is to tell the story of modern art in every country; but it is complete in itself, so complete and so excellent that I cannot but hope it may find a competent translator. I think it would have a wide welcome in America. It offers a very full account of all departments of French art, from the Revolution — which makes, of course, a very logical point of departure — up, literally, to the present day. If the chapters on architecture and on sculpture are less full and less entirely satisfactory than those on painting, we may remember that in painting the public always takes the greatest interest. And it is for the public and not specially for students that our author writes — not for the outer public, that is to say, which reads merely to be amused, but for the inner public, for those art-lovers who stand between the student on the one hand and the indifferent outsider on the other.

The way in which biographical is combined with critical material seems to me peculiarly admirable. Not only is a due balance held between the two in general, but great good judgment is shown as to whether much or little that is biographical shall be given in each individual case. When an artist's life has not stood in very vital relation to its artistic outcome, then but little is said about it; but when, as with David, or with Delacroix, or with Millet the connection has been intimate and controlling, then it is explained at length and in a very sympathetic and charming way. Even though we may have read biographies and monographs in plenty, we shall find the image of many an artist impressed more clearly on our minds after reading these intelligent surveys.

Yet, after all, the main value of the work lies in the clearness with which the tangled threads of the general history of the development have been unravelled and made plain before our eyes — in the tracing of those many influences which have been at work, harmoniously or discordantly, for a century past, in the characterization of those great tendencies, classic, romantic, naturalistic, realistic and impressionist. I cannot, I think, give too much praise to the manner in which Herr Rosenberg explains these tendencies, not only in their results, but in the forces which gave them birth, and not only in portraying those artists in whom one or the other found its extremest expression, but also — a much more difficult task — in portraying those in whom two or more met and expressed themselves together. So much impartiality united with so much real interest in the subject, so much appreciation for actual results united with so much sympathy for intentions, and understanding of necessary limitations, are qualities we do not often meet with in similar commentaries. The art of France is not conceived of as an independent, isolated development, but as one bound up with the current history of the people; and yet the error is not made of denying their just rôle to personal force of character and the bent of individual endowment.

The only fault I can find with the volume — and I dare say it will seem not a fault but a virtue to the majority of readers — is that too little attention is paid to the technical side of art. I do not mean that the character of an artist's painting is not dwelt upon in most of its factors; color, composition, drawing, subject-matter, sentiment — all these are fully and understandingly and instructively discussed, but an artist's technique as such — his manual style, his *handling* — is, to my taste, too much neglected.

I will say, in conclusion, that the many references Herr Rosenberg gives in his foot-notes add very materially to the value of his book. By their aid the student may pursue still further any special subject to which he is attracted; and taken together they form a list of the most valuable criticisms which have hitherto appeared upon the art of modern France. M. G. van Rensselaer.

The Rape of the Church. — In Wickford, R. I., is what is claimed to be the oldest Episcopal church in America. It was built in 1707, and was once stolen and transported a distance of seven miles. It was originally built on what was then called McSparren Hill, but in the course of seventy-five years the population had changed so that most of the worshippers came from Wickford, seven miles away. The proposition to remove the church was first made at a vestry meeting, but was so bitterly opposed by the few members who yet remained on McSparren Hill that the Wickford faction resolved on a *coup d'état.* The road from where the church stood to Wickford was all down hill. They mustered their forces one evening, collected all the oxen in the vicinity, placed the house on wheels, and while the opposing faction were soundly sleeping in their beds, hauled the holy edifice to the spot where it now stands, and where it has since remained. As it was utterly impossible to move the house back up the hill again, the surprised hill residents could only vent their rage in unchurchly language. Although the old building is still standing, the present society worship in a more modern edifice. — *Boston Transcript.*

[1] "*Geschichte der Französischen Kunst von* 1789 *bis zur Gegenwart,*" *Von Adolph Rosenberg.* Leipzig: Grunow, 1884.

RENDERING WOOD FOR BUILDING PURPOSES NON-INFLAMMABLE.[2] — I.



Old Furniture at the Soldiers' Carnival Boston, Mass., April 1885.

THE rendering of wood for house construction non-inflammable should be a subject of great interest to all. There is, however, little information obtainable from published works. The Japanese light structure is perhaps a necessary evil, but also has its advantages, and the Japanese would probably be unwilling, either from conservative feelings or from a question of expense, to build more costly, durable and fireproof houses. Let us see, then, how these wooden buildings may be preserved from destruction by fire, though the cost in the more thorough processes may be possibly sufficient to preclude their use among those whose poverty is the reason for their not building more durable houses.

Secondly, it must be remembered that an individual house, though it would not burn by itself, yet if surrounded by a conflagration of the adjacent buildings would smoulder away, though it would not burst into flame. Hence it is necessary that a block or small number of prepared houses should be together, in which case only those nearest to the advancing fire would be damaged and all the rest remain intact. This might be done by Government order, private agreement amongst themselves, or a fire insurance company, who would take insurance on any block so prepared at moderate rates.

Let us then proceed to pass the various processes in review, with their advantages and disadvantages fully set out, and with their capabilities for preserving fabrics as well as timber from fire. Should it be decided to impregnate the wood with chemicals, this can be done, or a superficial coating of fire-proof and water-proof paint over the wood may be put on, or both; but the Japanese do not paint their wood much, and might not care to do so. In either case it would be necessary to use a preservative, which, in places exposed to rain or washing, would not wash out. How far those non-inflammable salts which unite chemically with the albuminous and nitrogenous matter in the wood are capable of resisting wet it is difficult to say with certainty; but there are some which we shall proceed to give further on which do effectually resist water and soap.

Again it must be a *sine quâ non* that, whatever the fire-proofing material used may be, it must be one which, when exposed to the action of fire, does not give off injurious or suffocating smoke. Also, if the impregnation of the timber is to be thorough, *i. e.*, through the whole of the wood, it would be most advantageously done whilst the wood is green and the sap uncongealed; otherwise the tubes become clogged, and the injection of the chemicals only extends to a certain depth in the wood if the latter is dry. Impregnating the timber when green, and operating on large balks, would perhaps be more economical than upon smaller pieces when cut up. Moreover, the coarse-grained, quickly-grown timber required in this case is most suitable and cheapest; but then salts are said to make wood soft, and cut across the grain, so that it might be difficult with the ordinary hand-saw to cut out the more delicate work which is so largely used in Japanese houses.

Lastly, if the wood is impregnated while green, the non-inflammable solution acts chemically on the sap and destroys the germs of rot; for although most of the sap is driven out and replaced by the solution, still a little remains in the moist wood, and this would tend to dilute the injected solution, and also cause subsequent decay. Of course the "shortness" of the wood caused by salts applies to balks, whether prepared when green or well seasoned. These remarks are by way of preface. The following has reference principally to the preservation of telegraph-poles from decay, but is equally applicable to our subject.

Gavey and Douglas say: "The physical formation of a tree is made up principally of cellular tissue, woody fibre and vascular tissue. Cellular tissue consists of little colorless bladders or vesicles of various figures adhering together in masses and filled with liquids. Woody fibre is an elongated form of cellular tissue, incrusted and hardened by various substances, which give the distinguishing characteristics to different classes of timber. Vascular tissue consists of small membranous spiral tubes or vessels, which aerate and transmit some of the fluids in the plants. If a transverse section of a piece of exogenous timber be examined, it will be found to consist (1) of a small portion of central pith; (2) the woody portion, divided into the heartwood and sapwood; (3) the bark, which latter is divided into the true bark and epidermis; and, lastly, the medullary rays, which are thin vertical plates connecting the bark and the pith, and radiating from the centre to the circumference. In a young shoot, the pith, which consists wholly of cellular tissue, appears to serve as a vehicle

[2] A paper read before the Civil and Mechanical Engineers' Society on Wednesday, April 22. By Thomas Manson Rymer-Jones, M. Inst., C. E., F. R. G. S., and John Rymer-Jones, Memb. Inst. Tel., Eng. Reprinted from the *Building News.*

for the ascending sap, which, rising from the roots to the leaves, there comes in contact with the air, where it combines with the elements necessary for the formation of the tree. Woody or ligneous fibre and vascular tissue extend vertically downwards, and at the same time cellular tissue is formed horizontally. The ligneous fibres are attached to each other, as it were, in bundles, by their respective coats, whilst the cellular tissue is forced into the thin vertical plates, termed the medullary rays, which connect the pith with the bark (known as silver grain). The residue of the sap descends through the inner bark to the roots. Thus a layer of wood is gradually formed between the medullary sheath and the bark, and this continues until the approach of winter and the fall of the leaf stop the operation. On the following spring the sap again ascends, and during the year a second layer of wood is deposited; and as each season advances towards winter the deposit takes place more and more slowly, so that well-defined rings distinguish each year's growth; the number of the rings indicating the age of the tree in years, and the thickness of each ring the rate of its growth. Sometimes in hot climates there is so little difference in activity at various seasons that the rings cannot be accurately defined. In temperate seasons the sap rises during the spring, and leaves are developed. In summer the sap almost ceases to flow and vegetation remains stationary. In autumn the sap descends, and the leaves fall off. In winter the tree becomes again inactive. In tropical climates the dry season is the period of inactivity.

"When wood is going to be seasoned in the ordinary way, the best season for felling trees is when the circulation is least active; viz., the middle of the summer or winter periods of quiescence, and during the dry season in tropical climates. After a few years the ligneous fibres deposited nearest the centre become darkened, hardened, more dense, and apparently impervious to the sap, which latter circulates upwards through the layers of woody matter last deposited; hence the distinction between the heartwood and the sapwood."

Sabine and Douglas say: "Dr. Boucherie has discovered that no connection exists laterally between the tubes of a tree, and that by applying, under a moderate pressure, a colored solution to certain tubes at one end of a tree, the same tubes at the other end of the tree, and only those, are colored. In this way, at one end of a felled tree he applied a colored solution to certain tubes, forming the name 'Faraday'; the name was transmitted to the other end and was perfect at every intermediate section, showing that there was no lateral diffusion."

On the other hand, Langdon says: "That there is a lateral connection between the fibres may be proved by reference to a creosoted pole, where, under pressure, the creosote penetrates between one and two inches." It is generally understood that there is some, but very little lateral connection, so that in order to do it thoroughly the injection should take place from the ends. Inasmuch as the sap in timber contains the elements of decay, in the higher class of construction it is necessary to use wood most free from sap, or to a use of special means to eliminate it by the internal application of preservative solutions, which either expel or neutralize the fermentative portion of the sap. Although the solutions used generally for the preservation of timber from rot need not be the ones best suited for rendering the same fireproof, yet the method of application is similar. We will therefore describe the system most commonly used.

It is better and generally cheaper to select soft woods, such as Scotch pine, which is admirably adapted for injecting processes. It is of very coarse grain, its annular rings are wide apart, tissue soft, and capable of great absorption. The idea in the ordinary methods adopted for preserving timber from rot is to introduce into the pores of the wood some salt, which, uniting chemically with the albumen of the sap, is stated to convert it into an insoluble compound. The best known of these processes are Burnettizing, Kyanizing, and Boucherizing (creosote is, of course, out of the question). Burnettizing consists in impregnating the timber with a solution of chloride of zinc, and Kyanizing with corrosive sublimate (chloride of mercury).

Langdon says: "In both processes open tanks are filled with the solution with which the timber is required to be charged; the timber is then submerged, well fixed, and allowed to remain soaking until it has absorbed the proper quantity of the solution."

Culley says: "Kyanizing, or steeping the timber in a solution of bichloride of mercury or corrosive sublimate, has not been extensively tried for poles, because of the expense, and because it does not succeed unless the timber is dry. The poisonous nature of the salt is a very serious objection."

Spagnoletti says, with regard to the chloride of mercury process: "Two pounds of corrosive sublimate, at 3*s.* per pound, will be sufficient for fifty cubc feet of timber. The time for preparing should be one day per inch in thickness, and one day over. Thus, two days for one inch, three days for two inches, and so on; one advantage of this preservative is that the timber may be cut down and cast into the tank at once, the sooner the better, and no preparation or seasoning is necessary." He thinks it an excellent preservative of wood.

The superficial coating obtained by mere soaking is perhaps good enough for telegraph-poles, when the latter are thoroughly dry to begin with, and the heartwood hard; but to make wood fire-proof it would be necessary to thoroughly saturate the wood with the solution, and the following mode of injecting telegraph-poles is much better. The operation generally takes place in strong cylindrical tanks, in which are fitted hemispherical ends, removable at will; to save labor they are usually provided with a line of rails, which communicates with tramways running through the preserving-yard. The poles, being stacked on light trucks or trollies, are thrust into the the tanks, the ends of which being then closed, the interior is exhausted with powerful air-pumps driven by steam. The object of this is to draw out any moisture that may remain in the wood (the timber must be thoroughly dry before it undergoes the operation), and also to create vacuums in the pores, which may be filled by liquid. The liquid is then allowed to flow into the tank, and exposed to pressure varying from one hundred to one hundred and fifty pounds per square inch. The contents of the tanks and the quantity of timber in them being known, the exact quantity of salt injected into the wood per cubic foot can easily be calculated. The salts evidently combine with the elements in the sap which tend most readily to ferment, and, by precipitating them and forming new and insoluble compounds, check this tendency and lengthen the life of the timber. If a transverse section of a pole thus treated be examined, it will be found that the sapwood alone is permeated by the salt, the heartwood remaining untouched. The elements of decay, however, are far more fully developed in the sappy portion of the timber than in the heartwood, and the latter is rarely attacked (speaking of rot, of course, not of fire) until the former is rotten.

Sabine says: "The posts are put into wrought-iron cylinders, four and one-half feet to six feet diameter, and thirty-four feet to sixty feet long, closed at one end, and covered at the other with tightly-fitting tops. The cylinders are provided with manometers, safety-valves, etc., and connected with air and pressure pumps and a reservoir of the preservative solution. The wood is preserved by being subjected to a great pressure of steam, which, penetrating into the interior, not only tends to displace the sap from the pores and prepare them for the preservative solution, but also to coagulate the albumen in the sap, and in this way retard the subsequent rolling. After this the cylinders are exhausted and immediately filled with a solution of one part chloride of zinc and thirty parts of water (for Burnettizing) which is kept under a pressure of eight to ten atmosphere, equals one hundred and twenty to one hundred and fifty pounds for three hours; but it is questionable if this method is so good as that of Dr. Boucherie (Boucherizing), as it is necessary to force the solution into the wood at right-angles to the tubes, thereby injuring its strength and letting the sap, which is the immediate cause of decay, remain; the coagulation of the albumen in the sap to any material depth below the surface being a matter of doubt."

From this it would appear that the timber need not necessarily be dried prior to the operation, as other men state, and in coarse-grained woods, where the injection is complete throughout the whole bulk. This, then, is the degree of saturation when ordinary strong timber, consisting partly of sapwood and partly of heartwood, even when expensive cylinders with powerful air-pumps, etc., are used, so that the following method of injection, which is employed for Boucherizing, would (should no after considerations prevent it) be the most suitable for the purpose, should it be wished to completely saturate the woods throughout, since the apparatus is comparatively cheap and portable, the timber best suited being coarse-grained, quickly-growing, and consequently less costly, and, in fact, of the kind mostly used for house purposes, the operation performed in the forest where the timber is cut down, and whilst it is yet green and full of sap.

The method follows: Newly-cut green timber (coarse-grained is most suitable), before its bark is removed, is exposed at the butt ends to a slight pressure of a liquid column of sulphate of copper; the liquid is usually arranged in tanks at a height of some fifty feet above the level at which the tree is placed. The pressure forces the liquid through the longitudinal pores of the timber, till it drops out at the other extremity, both driving the sap before it and forming the chemical combinations which effect the preservation of the wood from decay. Poles should be exposed to the operation without the slightest delay after they are felled, or the process will probably fail, as the resinous substances readily harden and prevent the movement of the liquid salt through the pores. The plant needed is inconsiderable, and can be set up in any locality, the only requirement being a clear space of open ground; this gives this system an advantage over others which demand expensive and powerful machinery. The arrangements in a Boucherizing yard may be thus described: Any open tank of any convenient capacity is erected on poles, at a height varying from thirty feet to fifty feet; some prefer twenty-three feet to twenty-six feet from the ground. Culley says: "twenty-four feet, since, if it is too high, the liquid flows too rapidly through the timber to produce the best effect." From this tank descend two leaden pipes, about one and one-half inches in diameter, one of which is connected with the force-pump designed to fill the tank with liquid, the other serving to convey the liquid to the poles; the latter are laid side by side on racks placed horizontally, and are arranged at right-angles to a passage running the whole length of the yard. Down this passage is carried the leaden pipe from the tank, and at regular intervals of eighteen inches along this pipe small branch pipes with stop-cocks are fitted. As each pole is felled and hauled into the Boucherizing space, a section is cut off the butt end, to expose a fresh, uncoagulated surface of wood. Near the circumference of this newly-cut surface a strip or ring of India-rubber is nailed; then a flat board, somewhat larger than the base of the pole, is screwed against it by means of iron dogs (tenon bolts).

A hole in the centre of the board admits the insertion of a hollow

boxwood plug, which is connected with one of the small branch pipes previously alluded to, by means of a short length of flexible India-rubber tubing. This plate or disc, together with the India-rubber ring just mentioned, forms a water-tight chamber for the reception of the solution of sulphate of copper, communicating with the vertical pressure pipe. The air must be carefully expelled from the chamber formed at the butt end of the pole. This is best done by inserting a wire between the pole and the packing which forms the side of the chamber. After the tap has been turned to admit the solution, the wire is withdrawn, leaving a small hole, and when the liquid spurts out freely, showing that the air has escaped, this hole can be closed by a blow from a hammer. Neglect of this precaution has frequently prevented the injection of the upper side of the entire pole. The tap being turned, the liquid solution is driven into the pole with a pressure dependent on the height of the tank above the racks.

The proportions of the solution are one pound of sulphate of copper to five gallons of water (Douglas says one part by weight of the salt to one hundred parts of water). It is usual to inject 0.35 pound of the sulphate into every cubic foot of timber. This gives a weight of one and one-half to two pounds of sulphate for the smallest pole (about twenty-five feet long). After the lapse of a period varying from two to twenty-four hours, the liquid makes its appearance at the top of the pole and drops into gutters placed conveniently to catch it. Douglas says "three days is the average time required to inject a twenty-five foot pole." The process is complete when every portion of the top of the pole is found to be saturated with sulphate of copper. This is known to be the case when a brown stain is left on the timber by the application of a piece of potassium ferrocyanide.

Another authority says: "Scotch fir having a very open grain is the best suited for preservation by the injecting process. To Boucherize successfully, the worst timber (that is, as regards its chance of lasting unprepared) is wanted. In some cases, where the poles were too old, a month elapsed before the copper liquid applied to the butt appeared at the top of the poles."

Another authority of large experience says: "Scotch fir, grown on a peaty soil, coarse grain and open: The average time taken to successfully Boucherize three twenty-eight-foot poles, during the months of April, May, June, July, August and September was from five to seven days. In October, November and December, January, February and March, about ten days. In June, the quantity of liquid that percolated through three twenty-eight-foot poles was sixty-eight gallons, and soft larch took a few days longer than the Scotch, but answered very well. Some few red or hard larch were successfully done, but in others the solution only penetrated a very short way from the end. Spruce and silver pine answer well, but take much longer than do either larch or Scotch."

Cully says: "It is quite possible to inject trees that have been cut down two or three weeks; but the labor will be much more costly than when injected in the forest on the day they are felled, because the pores contract in drying. It is extremely difficult to inject larch unless it is of very open grain and very free from resin. The liquids cannot penetrate the hard wood, and it has sometimes happened in Boucherized poles that the heartwood, which is more durable than the sapwood under ordinary circumstances, has rotted, leaving the sapwood sound. Spruce and Scotch fir are very suitable, and these cheaper descriptions of fir are rendered more durable than the more expensive sorts when unprepared. The cost of the sulphate process calculated on five thousand two hundred and eighty-seven Scotch fir-poles injected in the forest, and averaging twenty-five feet in length, is about 2*d*., equal to four cents per lineal foot of timber."

Another authority says: "The process is most successful during the spring and summer months (Culley says the autumn), when the sap is in the wood. Cold hinders, and frost stops it." Timber, when chosen for strength and seasoned in the ordinary way, is of course felled in the winter months, when the sap has retreated from the wood. It is possible to treat the wood, with equal success, from the top or small end as from the butt end. The application of the sulphate of copper to the small end instantly starts the sap, which pours out from the large end. The Boucherizing of the pole was completed, in a particular experiment, in the usual time. In the construction of a house it would be necessary, in the case of the upright timbers which stand in the moist ground, to provide for the escape of the fire-proof salt, by paving the lower end with a coating of some insoluble or water-proof paint, which should also be fire-proof. Such a paint we shall give farther on. Without this precaution much of the salt is lost in the ground, and the surrounding ground in which the Boucherized pole stands will be found tainted for some twelve inches or more with sulphate of copper."

Dr. Boucherie says, however: "It is an error to suppose that the sulphate of copper is very soluble, or that when it is exposed to the rain its preservative power disappears after a certain time. The sulphate of copper fixes itself into the elements of the wood, and could not be dissolved by washing. Cases of failure are to be attributed to a disease in the wood, the diseased tissues seeming to resist the sulphate."

Professor Abel also objects to the theory of the salt being washed out when a telegraph-pole is standing in moist ground. He says: "I believe a small quantity of the copper salt is converted into insoluble compounds. The action of the metallic compounds is to combine with certain albuminous substances in the wood, by which they are converted into insoluble substances, and it is by the chemical alterations which these undergo that the preservative effect is produced." It is generally allowed, however, that the preservative effect of sulphate of copper is very variable.

Professor Abel, judging from experiments on Boucherizing and Kyanizing for the preservation of wood from decay, says: "Generally the results were favorable to Boucherizing." He believes "opinions are fairly divided between them — that is, the copper salts and mercury salts, which are undoubtedly both good preservative processes."

Dr. Boucherie says: "Sulphate of copper combines so well with the celluline that washing with pure water will never expel it."

Culley says: "The sulphate of copper must be free from iron, as it is inert and possibly hurtful; besides this, the iron becomes oxidized by exposure to the air and forms a muddy deposit, which chokes the fine filter formed by the pores at the end of the pole, and thus stops the process, as the sulphate always contains *some* iron (Japanese sulphate of copper obtained from the Mint contains a large quantity but varies much in this respect). It is well to make a saturated solution and allow it to remain exposed to the air as long as possible, so that the iron may deposit at the bottom of the vessel, after which it may be diluted for use. If the solution is too strong, it appears to contract the sap vessels and to crystallize at their ends. The water must be free from lime and perfectly clear. If it contains lime it is as well to add a little sulphuric acid to precipitate it, and either allow it to settle, or filter the water through sand, for even the slightest cloudiness interferes with the injection."

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

THE WEST FRONT OF THE CATHEDRAL OF NOTRE DAME, ROUEN, FRANCE.[1]

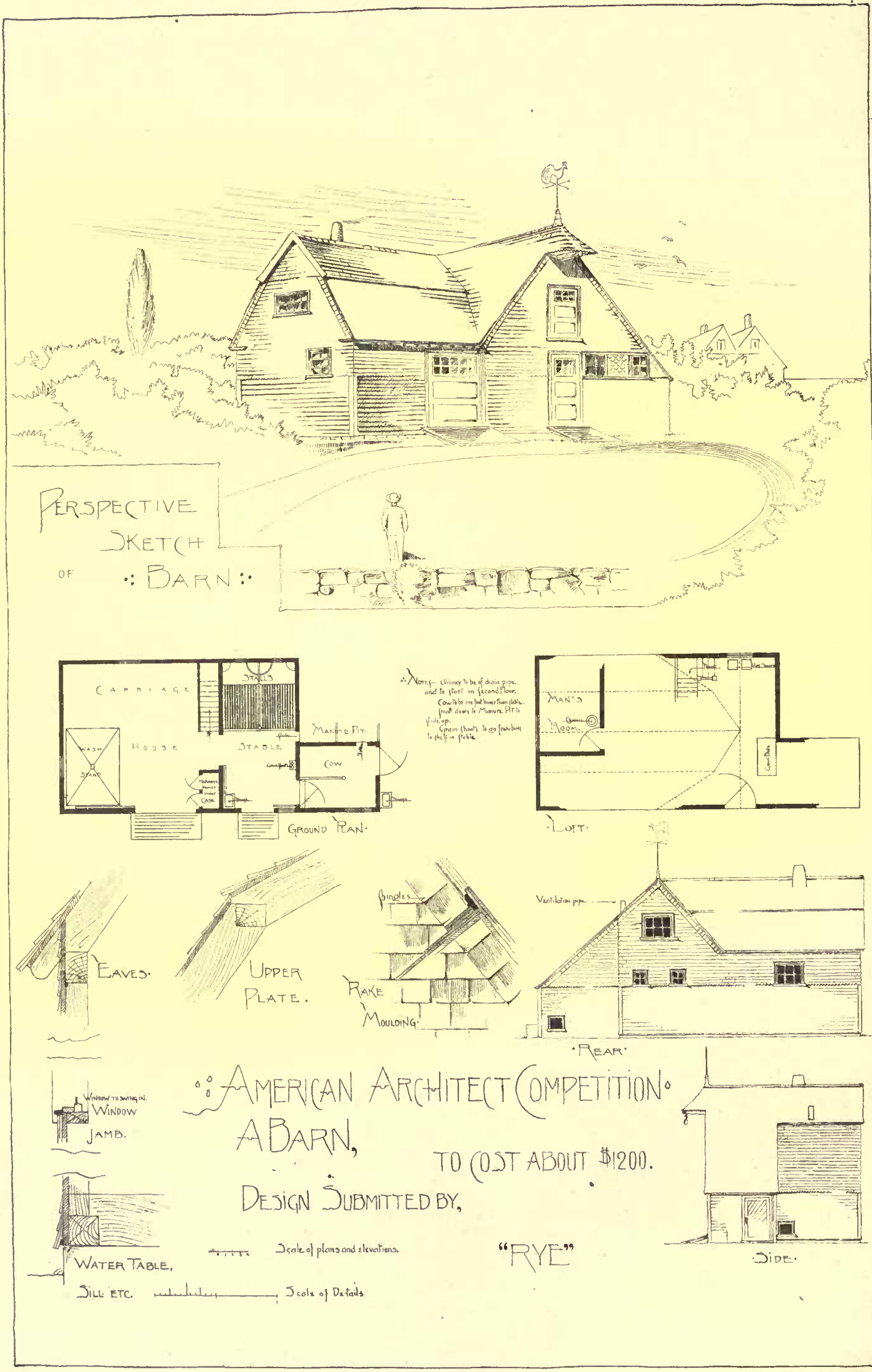
JOHN SELL COTMAN, "the second painter of the Norfolk School," was born at Norwich in 1782. He was mainly self-taught as an artist. In 1800 he went to London and resided there for some years, exhibiting at the Royal Academy till 1806. He then returned to Norwich, and was made a member and secretary of the Norwich Society of Artists, afterwards becoming vice-president, the president being John ("old") Crome. In 1834, through the influence of Turner, he was appointed Professor of Drawing in King's College School, London, which position he held until his death, in 1842.

Cotman was a landscape and marine painter of great power. He used both oil and water-color, although perhaps best known by his etchings of architectural subjects: referring to the latter, he said, "I decidedly follow Piranesi." His principal works in this direction were "*Architectural Etchings of Old English Buildings*," 2 vols., folio, 240 plates; "*Sepulchral Brasses of Norfolk and Suffolk*," 2 vols., 170 plates; "*Liber Studiorum*," 48 plates. After several journeys to France, he issued his most famous work, "*Architectural Antiquities of Normandy*," in two folio volumes, comprising one hundred plates. This was published in 1822, with descriptive letter-press by his friend Dawson Turner, the architect and antiquary, who had accompanied him on his journey to Normandy in search of material for the book. Our plate, with others of a similar nature which we have reproduced, is taken from this work, in which he preserved many neglected and decaying monuments of the past.

Cotman's plates are rich in accurate detail, but wanting in qualities of light and shade. He must not, however, be judged as an artist by his somewhat dry and antiquarian etchings alone. He had a thorough knowledge of the varying faces of Nature, and was not deficient in imaginative power. We owe him thanks for faithfully and lovingly transcribing for us the relics of ancient Normandy, leaving to Turner (who followed in his footsteps some years later with "*The Rivers of France*") the clothing of castle and spire, with a veil of glorious though fading splendor — false but beautiful. The more honor to Cotman, as he had the true artist's nature, too, and had woven magic webs of shifting color with his own brush. Wedmore, in his "*Studies of English Art*," says that he might almost be called the precursor of Turner, in experimenting with effects of color and light.

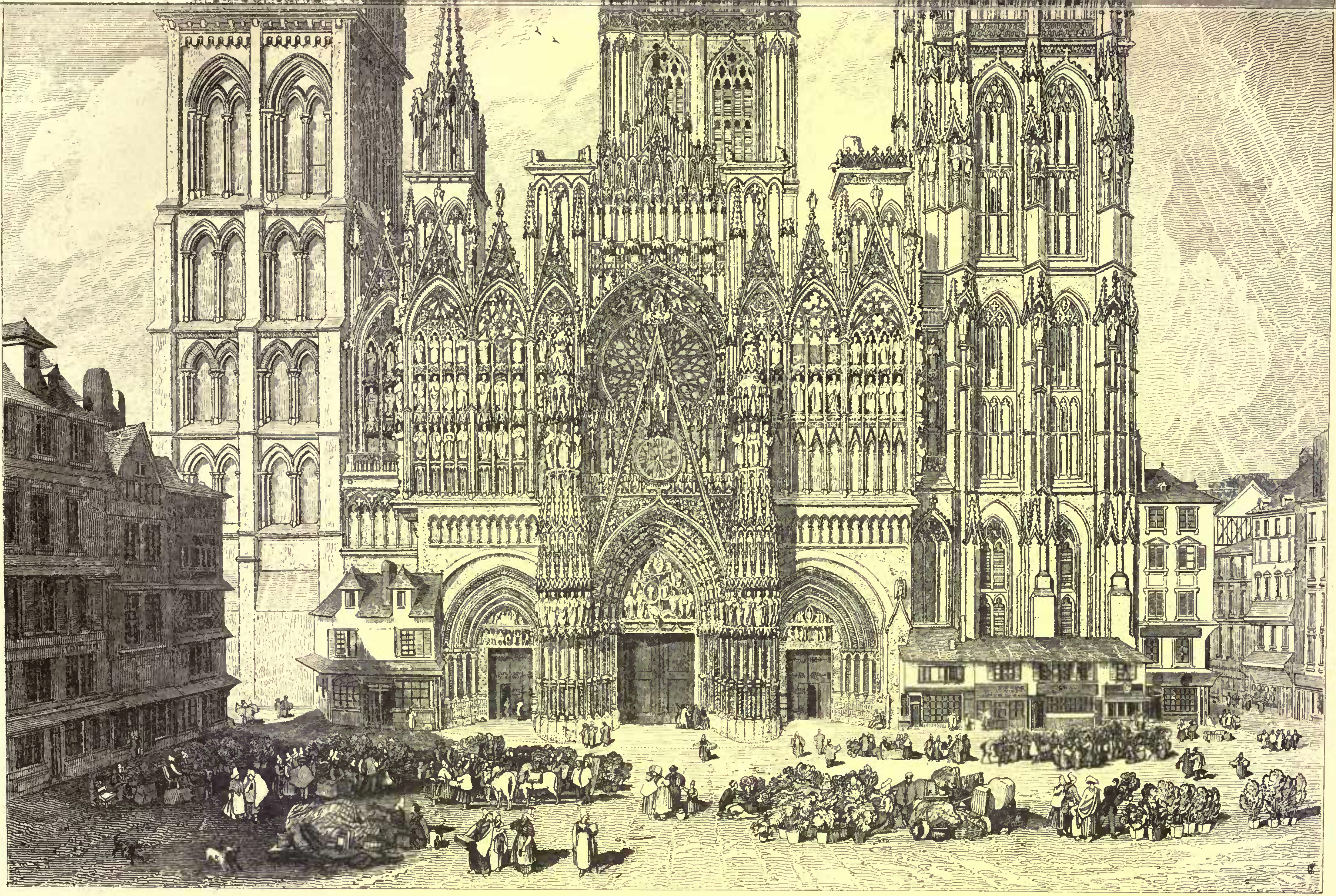
"THE western front of the cathedral offers a *tout ensemble* of the most imposing character. The very discrepancy in the different parts, by increasing the variety, adds to the effect of the whole. All, with the exception of the northern tower, is rich even to exuberance; and the simplicity of this, at the same time that it appears to lay claim to a certain dignity for itself, places in a stronger light the gorgeous splendor of the rest. The opposite tower, the work of the celebrated Cardinal Georges d'Amboise, and formerly the receptacle of the great bell that bore his name, commonly passes by the appellation of the *Tour de Beurre*. Tradition tells, or, to use the words of Don Pommeraye, 'everybody knows' that it obtained this name from its being built with the money raised from the indulgences granted by the Cardinal, William d' Estouteville, to the pious Catholics throughout the dioceses of Rouen and Evreux, allowing

[1] From Cotman's "*Antiquities of Normandy*."



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CATHEDRAL CHURCH OF NOTRE DAME, AT ROUEN.

IN THE YEAR 1821.

them to make use of milk and butter during Lent, when oil only could otherwise have been employed by way of sauce to vegetables and fish. The bull issued upon the occasion by Pope Innocent VIII is stated to be still in existence.[1] The architecture of this tower may almost be regarded as the perfection of what has been called the Decorated English style. It is copiously enriched with pinnacles and statues, and terminates in a beautiful octagonal crown of open stone-work. Its height is two hundred and thirty French feet.[2] The central portal, for the erection of which the cathedral is likewise indebted to its great benefactor, Georges d'Amboise, projects beautifully and boldly, like a porch, before the rest. Every side of it is filled with niches, tier over tier, all crowded with endless figures of saints and martyrs. In the middle of it rises a pyramidal canopy of open stone-work, and upon the wide transom stone over the door is sculptured the genealogical tree of Christ, arising from the root of Jesse. The carving over the north entrance is yet more peculiar, and evidently far older. It represents the decapitation of the Baptist, with 'Salome dancing in an attitude, which perchance was often assumed by the *tombesteres* of the elder day; affording by her position a graphical comment upon the Anglo-Saxon version of the text, in which it is said, she *tumbled* before King Herod.' Four turrets flank the central portal; one of them only is now capped by a spire; the pinnacles of the remaining three were swept away by a storm which traversed Normandy for a considerable extent, on the 25th of June, 1683, marking its progress with a devastation that is scarcely to be conceived. The spire of the central tower, however vaunted and admired by the French themselves, looks to an unprejudiced eye mean and shabby, and principally from its being made of wood, which ill accords with the apparent solidity of the rest of the building."

COMPETITIVE DESIGN FOR STABLE, SUBMITTED BY "*Rye*."

THERE will be no cellar. The building will be set on a trench-wall. The frame will be of spruce, and will be covered with hemlock boards. First floor of two-inch plank; second floor of matched spruce boards. Stable, carriage-room and man's room to be sheathed on walls and ceilings. Stall-gutters, feed-boxes and hay-racks of cast-iron. The cow-stable is entirely distinct from the horse-stable, with door between. Water-pipe to connect with troughs and wash-stand, and to be carried from wash-stand and gutters in stable to a cesspool. Roof and upper part of walls shingled and lower part of walls clapboarded, as shown on elevations. There will be a ventilation-pipe over each stall which will unite into one pipe and pass through the roof.

State Street, CAMBRIDGEPORT, MASS.
We will build stable according to design by "*Rye*" for $1,200.
JOHN L. MAYERS & CO.,
Carpenters and Builders

THE DINING-HALL IN THE MEMORIAL HALL OF HARVARD COLLEGE, CAMBRIDGE, MASS. MESSRS. WARE & VAN BRUNT, ARCHITECTS, BOSTON, MASS.

[Gelatine Print, issued only with the Gelatine Edition.]

THIS building, plans, elevation and certain details of which have appeared in former numbers of this journal, was completed in 1878. The central part of the building is the monumental vestibule to Sanders Theatre on the one hand and to the Dining-Hall on the other; in this vestibule are contained the memorials of the students and graduates of the University who died in the service of their country in the war for the Union. The Dining-Hall, shown in the gelatine plate, is 58 feet 6 inches wide by 149 feet long; it contains ten bays, with open-timbered hammer-beam roof; has galleries at either end; shows brick construction on the interior walls; and, against the wainscot, are set the busts and portraits belonging to the University. The Hall is used for the great annual festivals; and daily during term times it serves as commons hall for about 600 students, who take their meals here under the auspices of an association managed by the students themselves. The windows are to be filled with memorial glass of the first grade; of these eight are already occupied and several more are immediately contemplated or are in process of construction. Most of them are erected by classes in memory of classmates who fell in the war for the Union.

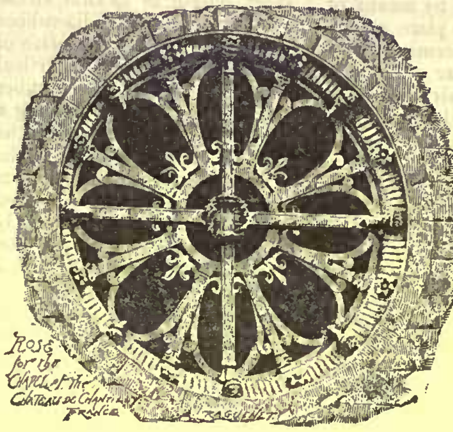
DESIGN FOR A HOUSE. MR. ROBERT OYLER, SPRINGFIELD, MASS.

[1] *Pommeraye, "Histoire de l'Eglise Cathédral de Rouen,"* p. 36.
[2] The following are the dimensions of the principal parts of the cathedral, in French measure, copied from Mr. Turner's *Tour in Normandy*, I, p. 147:—

	French feet.		French feet.
Length of Interior,	408	Length of Transept,	164
Width "	83	" Lady Chapel,	88
Length of Nave,	210	Height of Spire,	380
Width "	27	" Towers at west end,	230
" Aisles,	15	" Nave,	84
Length of Choir,	110	" Aisles and Chapels,	42
Width "	35½	" Interior of Cent'l Tower,	152
" Transept,	25½	Depth of Chapels,	10

[A French foot contains 12¾ English inches.]

SOME CELEBRATED TIMBER ROOFS.[3]—I.



MY subject to-night is celebrated timber roofs, and perhaps some one may be inclined to ask at the outset, Why not rather iron roofs, since the most conspicuous roofs of the present day — such, for example, as our great railway-station sheds — are now carried by iron framing? Possibly it would be a sufficient answer to reply that this is Carpenter's Hall, and that I desired to select a topic which has to do with carpentry.

A good roof displays the skill of the carpenter better than any other piece of work, so that we should study the best things of the sort that have been done, even if only out of interest in carpentry. Another and a better reason is that, though the iron-master is constructing our largest roofs now, he is not able to compete with the carpenter when it comes to roofs of moderate size, and as those of us here who are carpenters and builders, or who have to design buildings, will be sure to have to do with timber roofs for all ordinary work, it will be a help to know something about the best specimens that exist. A man never does full justice to himself unless he knows and can understand something a little beyond what he actually has in hand. So a single famous roof, thoroughly mastered, will be instructive even to those who have only very modest ones to frame.

Moreover, though iron-work has been found to have advantages which carpentry does not possess when the new requirements of trade and travelling have to be met, it must not be forgotten that in those numerous instances where the roof forms part of the architectural treatment of a fine interior, such as a church or public hall, timber from the very nature of things holds its own, and must do so. No ingenuity could fit buildings such as the Guildhall or Westminster Hall with iron roofs that would be consistent and beautiful, and where a roof is to be a work of art as well as of skill, the carpenter must frame it.

Last, and by no means least, manufactured iron is not to be had everywhere. In the colonies, and in many foreign countries, if a large roof is wanted there is nothing but timber to make it of; and as, happily, England and her colonies are growing closer together as time goes on, we must be ready, any of us, in case we are wanted, to build or design in a manner suited to the circumstances of countries far removed from our own. I trust, therefore, that, for all these practical reasons, and not simply as an antiquarian or scientific study, we shall find it profitable to give attention to a few of the best known examples of timber roofs, ancient and modern.

[The lecturer here discussed and explained some of the elementary principles upon which carpenters base their practice in the matter of roof construction.]

Very large timber roofs on the queen-post principle have been framed. The limit to the span which may be usefully covered is the length of timber obtainable; for though the tie-beams, which are only under tension, may be joined, the rafters must each be in one piece. A great difficulty arises, however, in practice, especially in the case of roofs of fir-timber, which, though light, strong and elastic, is apt to lose its elasticity in time, and take a permanent set. Fir-timber, unfortunately, is also comparatively soft, so that the very great weight of the roof and its covering, with the addition of wind-pressure and snow, etc., is apt to squeeze the timbers together at the joints, and to cause a slight giving way, which throws the framing more or less out of shape, and destroys its efficiency.

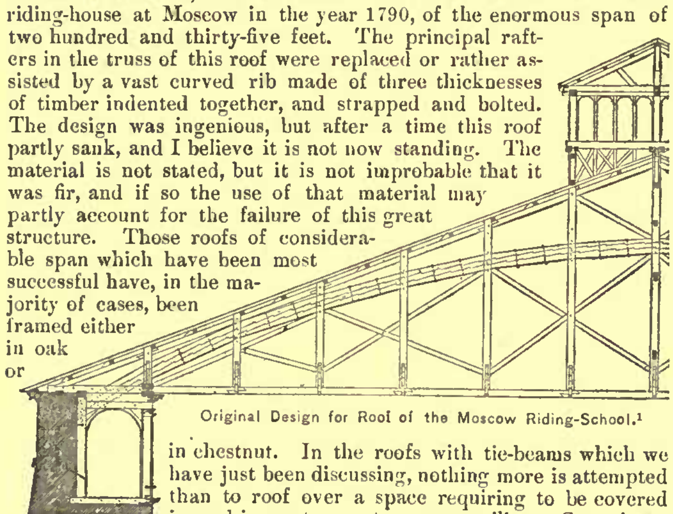
Examples of roofs with tie-beams, and either king-posts or queen-posts, abound. Few of them can, however, be fairly called famous; partly, no doubt, because they mostly carry ceilings, and so their construction is seldom open to inspection.

I will, however, refer to one very bold timber queen-post roof, with a tie-beam and collar-beam, which is instructive because it has partly failed, and which can be seen without difficulty. I refer to the roof over part of the Southeastern Railway's London-Bridge Terminus. This roof was put up about the year 1850, and every principal is now supported by a prop. The span is ninety-two feet. The trusses are twenty-one feet apart from centre to centre. The principal rafter is twelve inches by nine inches, and the tie-beam fifteen inches by nine inches. In each truss there are five iron rods doing duty as queen-rods and intermediate rods, and the heads of the principal rafters and straining-piece are received into a cast-iron queen-head. The pitch, *i. e.*, the slope or angle with the horizon, is 21° only.

[3] A lecture by Professor T. Roger Smith, delivered at Carpenter's Hall on Wednesday evening, April 1st, being the last of the present series of "Free Lectures to Artisans on Matters connected with Building," given under the auspices of the Carpenter's Company, and published in the *Builder*, the illustrations being added by the *American Architect*.

The failure of this roof may probably be traced to a series of causes rather than to any one prominent defect. The deficiencies of fir-timber have been already pointed out, and here as elsewhere a close examination would no doubt show that the joints have compressed slightly, and that the timbers have bent. The distance apart of the principals is rather great, which throws a greater load on each truss than it ought to have. The pitch is too flat, which greatly increases the strain upon every part of the structure. The braces under the principal rafter are too few, and both the principal rafter and the collar-beam are loaded not at the strong points, those, namely, stiffened by the braces, but at points away from them, so as to be subjected to some cross strain. The scantlings are light, considering the work the timbers have to perform; and the large amount of flat space in the middle, and the small angle of the slope at the sides, would favor the lodgement of snow, so that a heavy fall of snow would throw a tremendous burden on to the framework of this roof in addition to what it has ordinarily to carry. Putting all these causes together, there is no reason to be surprised at the failure of this roof; and yet its appearance is striking, and gives the idea of its being both elegantly, skilfully and boldly designed. Boldness has, however, been pushed too far.

It is believed that the widest timber roof in one span, with or without a tie-beam, ever executed is one that was erected over a riding-house at Moscow in the year 1790, of the enormous span of two hundred and thirty-five feet. The principal rafters in the truss of this roof were replaced or rather assisted by a vast curved rib made of three thicknesses of timber indented together, and strapped and bolted. The design was ingenious, but after a time this roof partly sank, and I believe it is not now standing. The material is not stated, but it is not improbable that it was fir, and if so the use of that material may partly account for the failure of this great structure. Those roofs of considerable span which have been most successful have, in the majority of cases, been framed either in oak or in chestnut.



Original Design for Roof of the Moscow Riding-School.[1]

In the roofs with tie-beams which we have just been discussing, nothing more is attempted than to roof over a space requiring to be covered in, and in most cases to carry a ceiling. Sometimes, also, it has been desired to form a loft of some sort in the hollow space in the roof, and as the framing employed for these purposes has been designed to secure only those ends, it has been possible to use all the timbers in the situations where the very most could be made of them.

In making a roof, however, we enclose and cover in a large space above the tops of our walls, and in many cases it is desirable to use this space, not by constructing a loft in it, but by adding it on to the space below. This is simply enough done by putting such a roof as we have described on side walls, and leaving out the ceiling; but the tie-beams and framing very often have an appearance not in accordance with the architectural design of the building, and in many cases, as, for example, in the nave of a church, where the gable is occupied by a large window, the line of them will cut across and destroy the effect of an architectural feature. Accordingly roofs without tie-beams have been found requisite, and these form by far the most important and most interesting part of our subject. Roofs of this class were largely employed throughout the period which saw the rise and progress of Gothic architecture, as well as in modern times.

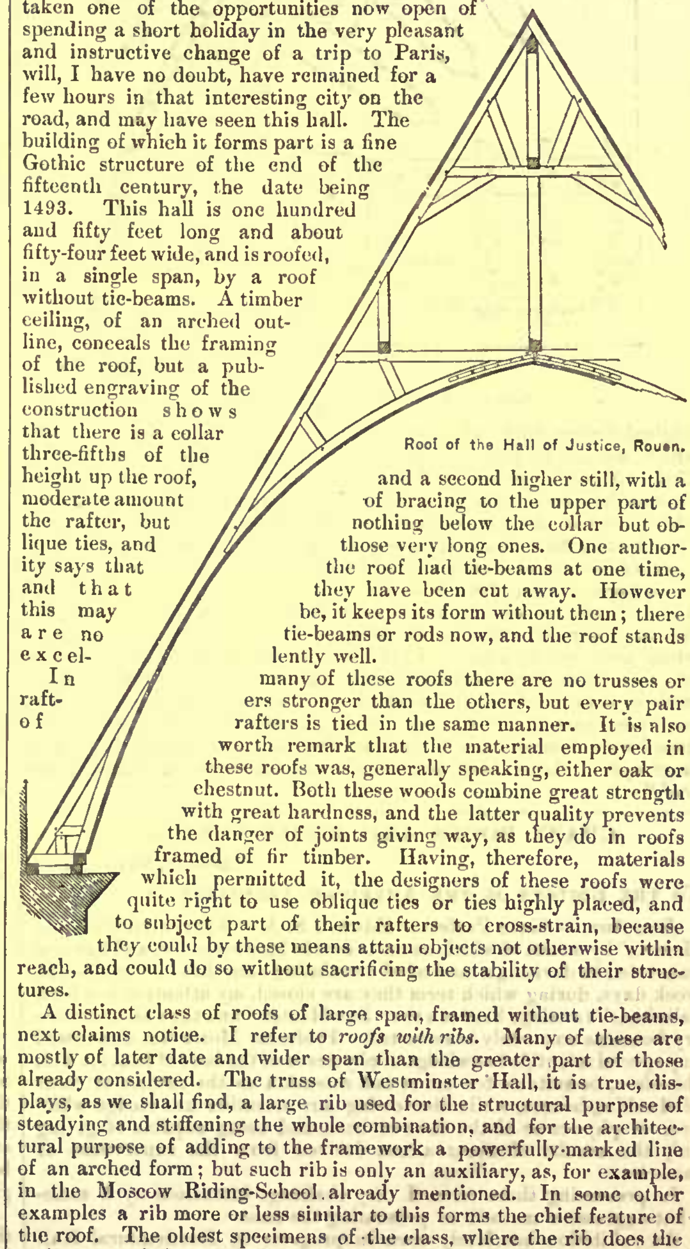
My friend Professor Kerr, in his opening lecture,[2] was necessarily restricted by his subject to tie-beam roofs, so that this class of structures was not touched upon by him; but I regret that when alluding to an unscientific form of roof occasionally to be met with in churches of small span, he did not do our forefathers the justice to add that innumerable specimens of their skill as roof-carpenters, accompanied by the greatest taste, have come down to us from the past. He may (unintentionally, I am sure) have left on the minds of some here the impression that the Gothic idea of a roof was only to throw a beam from wall to wall, to stand a post on the middle of it, and then to carry rafters from the top of the post to the wall. I am quite aware that this sort of roof is to be met with, yet I hope to succeed in showing you that in the centuries we call the Middle Ages carpentry was carried to great perfection, and I am the more anxious to do this because there is no country in Europe where carpenters were more skilful than in England, and because the acknowledged masterpiece of ancient carpentry is to be found in this metropolis, the work of English hands and the contrivance of English designers.

[1] We give an illustration of the truss to which the lecturer refers, although he has fallen into the common error of believing that the roof of the Moscow Riding-School was executed according to this, the design of a German carpenter, prepared about 1790. The building, by the way, which the roof was intended to cover, measured about 72m x 585m in the clear. The roof, as actually constructed, was designed on an entirely different principle, by M. de Betancourt, and was built about 1818, after very exhaustive tests of trial trusses, in the short space of five months.

[2] See *Builder*, p. 264, *ante*.

We have seen that where a timber is short it may be able to sustain a considerable amount of cross-strain, such as would break it were it long, and the earliest attempts at throwing the roof more into the body of the building than is possible with a tie-beam were made by putting the tie part of the way up the rafters, so that there was a short piece of rafter between it and the wall exposed to a strain which is partly transverse. A second step was taken when, in order to get rid of the straight line of the tie, two oblique timbers, each starting from the foot of one rafter and getting hold of the other some way up, were employed. Sometimes these two methods were combined, as in the timber roof over the vaulting of Westminster Abbey. In this manner, but with all kinds of variations, sundry very picturesque church roofs have been framed. Some of them carry polygonal ceilings, others show their timbers; but in either case the eye is carried upwards, and the space in the roof is virtually added to the building.

One remarkable example of this kind of roof is to be seen at the Hall of the Palace of Justice, at Rouen, and those of you who have taken one of the opportunities now open of spending a short holiday in the very pleasant and instructive change of a trip to Paris, will, I have no doubt, have remained for a few hours in that interesting city on the road, and may have seen this hall. The building of which it forms part is a fine Gothic structure of the end of the fifteenth century, the date being 1493. This hall is one hundred and fifty feet long and about fifty-four feet wide, and is roofed, in a single span, by a roof without tie-beams. A timber ceiling, of an arched outline, conceals the framing of the roof, but a published engraving of the construction shows that there is a collar three-fifths of the height up the roof, and a second higher still, with a moderate amount of bracing to the upper part of the rafter, but nothing below the collar but oblique ties, and those very long ones. One authority says that the roof had tie-beams at one time, and that they have been cut away. However this may be, it keeps its form without them; there are no tie-beams or rods now, and the roof stands excellently well.



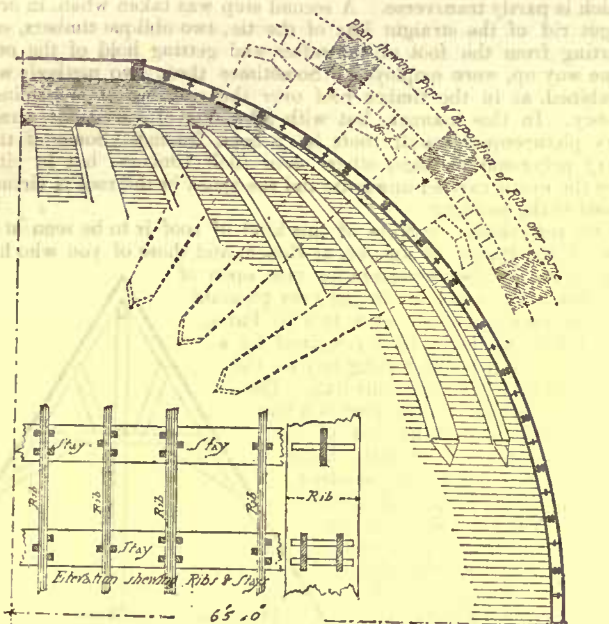
Roof of the Hall of Justice, Rouen.

In many of these roofs there are no trusses or rafters stronger than the others, but every pair of rafters is tied in the same manner. It is also worth remark that the material employed in these roofs was, generally speaking, either oak or chestnut. Both these woods combine great strength with great hardness, and the latter quality prevents the danger of joints giving way, as they do in roofs framed of fir timber. Having, therefore, materials which permitted it, the designers of these roofs were quite right to use oblique ties or ties highly placed, and to subject part of their rafters to cross-strain, because they could by these means attain objects not otherwise within reach, and could do so without sacrificing the stability of their structures.

A distinct class of roofs of large span, framed without tie-beams, next claims notice. I refer to *roofs with ribs.* Many of these are mostly of later date and wider span than the greater part of those already considered. The truss of Westminster Hall, it is true, displays, as we shall find, a large rib used for the structural purpose of steadying and stiffening the whole combination, and for the architectural purpose of adding to the framework a powerfully-marked line of an arched form; but such rib is only an auxiliary, as, for example, in the Moscow Riding-School already mentioned. In some other examples a rib more or less similar to this forms the chief feature of the roof. The oldest specimens of the class, where the rib does the main part of the work known to me, are two Italian examples, of which Professor Lewis has kindly sent particulars. A great hall at Vicenza, known as the Basilica, built in 1314, though since modernized, no less than seventy feet wide, is covered with a curved roof in the form of a pointed arch, in a single span from wall to wall, curved outside as well as in, and so resembling very much the hull of a ship turned upside down. The supports of this roof consist of ribs of timber about twelve inches by twelve inches. Each rib is tied by two iron tie-rods, the first about one-third of the height up from the springing; the second about two-thirds up. A still larger hall of about the same date exists at Padua. It is two hundred and sixty-one feet long by about eighty-five feet wide, and has a similar roof, of which the ribs are about thirteen inches by thirteen inches, and about six feet apart. They (like those at Vicenza) are secured by iron rods; but in this case the rods are introduced differently in alternate ribs, the first at the springing, and the second part of the way up, and so on.

Roofs with ribs did not, however, become common till a much later

date. The next example that I have to quote is a roof which was erected over the Corn Market in Paris in the year 1662. This building is circular, and about one hundred and thirty feet in diameter. The present roof is a dome-shaped one on iron ribs, interesting as an early example of the application of iron to roofing, but the



Roof of the Corn-Market. (*Halle au Blé.*)

original timber roof, which was also dome-shaped, is the one with which we are at present concerned. It was destroyed by fire in 1802. A good account of its construction is given by Mr. Tarn in his excellent little treatise on roofs of wood and iron: "The circular ribs consisted of planks nine feet long, thirteen inches broad and three inches thick; each rib consisted of three of these planks bolted together in such a manner that no two joints met. A rib was begun, for instance, with a plank three feet long, standing between one of six feet and another of nine feet, and that was continued to the head. No machinery was needed for hoisting such small pieces, and the whole went up like a piece of brickwork. At various distances these ribs were connected horizontally by purlins and iron straps, which made so many hoops to the whole dome. Some of the ribs were discontinued part of the way up. Near the top those that were continued were framed into a circular ring of timber which formed a large eye in the middle, over which was an umbrella-shaped glass roof."

CRAZY ROOFS AND ROOFS SENSIBLE.

BOSTON, May 16, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Since Professor Edward S. Morse invented his "Sun Heater," by means of which he saves coal in his own house, and has also succeeded in devising a method of ventilating churches throughout the week days, during which term they are closed, my attention has been called to the analogy between the "Sun Heater" and the roof of a country house as commonly constructed. Professor Morse has disavowed any special scientific knowledge of physics or of the laws of heat; it will, therefore, be suitable for me to call attention to the subject of roofs of dwelling-houses, while disavowing any scientific knowledge whatever of physics or of the laws of heat, and being capable of giving only the results of observations derived from the supervision of factories.

In presenting these views I may challenge discussion by a somewhat aggressive method of presenting the case.

An exhibition has lately been in progress in Horticultural Hall under the title of the "Crazy Quilt Show." The writer did not visit it, but assumed that it contained a large number of examples of wasted material and wasted labor in the form of patch-work and of art, so called, badly done in crewels, well named crewel (cruel) in more senses than one. The writer suggests that this hall be presently engaged for a "Crazy Roof Show," in which may be exhibited a large number of the designs which have lately been adopted in the construction of the roofs of country houses during the period of the so-called Queen Ann craze. He doubts if so many examples of the misuse of materials and of thoroughly bad design could be found even among the crazy quilts.

It would seem to be most necessary to put the elementary question, What is the object of a roof? at the beginning of a treatise upon the subject and to define the end sought.

The objects of a roof are as follows:—*First,* to keep rain-water out of a house. The crazy roofs fail to do this effectually. *Second,* to prevent the snow collecting on the roof of a house. The crazy roofs fail to do this. *Third,* to keep the heat of summer out of the house. The crazy roofs fail to do this. *Fourth,* to keep the warmth generated by the consumption of coal within the house in winter. The crazy roofs fail to do this.

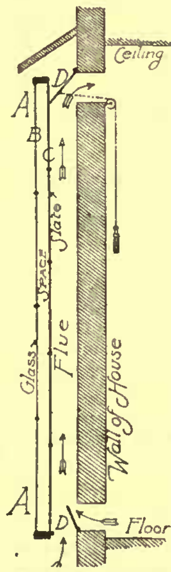
What do they accomplish? Almost nothing for which a roof is intended; but this much may be said in their favor: they form a fitting superstructure to a shingle palace which in most other respects beside the roof is unsuitable to the climate or to the surroundings of New England.

The house which is customarily covered by the crazy roof has neither dignity, repose, nor any air of comfort about it. Windows which are commonly supposed to be intended at least in part to admit light within, have gaudy stained-glass in the wrong place—at the top, where they exclude the light at the most important point. There is no appearance of solidity or stability about the house, and as soon as it begins to become shabby, which is within a very short period after it has been finished, it becomes as shabby as possible. In the slang of the university:—

> "When they are *fresh*
> They are very, very fresh,
> And when they are shabby
> They're horrid."

Compare one of these perky, pretentious, intrusive, shabby-genteel "residences," so called, with the comfortable old dwelling-houses of our grandfathers, and mark the contrast. One wants to write a new version of "The Devil's Walk" in order to include them in it. Of course, these epithets apply to only a portion of the new houses; many, and perhaps we might say most of the later structures are excellent in their way.

The old dwelling-house had as true a roof upon it as the condition of the arts of that day permitted. The house faced the south, two stories in the front with a very short slope of roof presented toward the hot sun, but toward the north it sloped back nearly down to the ground, over the lean-to, back of the kitchen away from the sun. It was well constructed of good materials, put together by true joiners, who joined the boards and closed the cracks. It was not like the modern roof, a *sun-heater in summer,* from which Mr. Morse might have borrowed his invention; neither was it a refrigerator in winter, as our roofs are apt to be, especially when covered with slate.



A A The Sun-heater.
B Glass.
C Slate.
D D Valves by the operation of which the outer air may be drawn into the room above, or the air of the room may be drawn out below.

I will now venture to describe the kind of roof which might be made use of to the great comfort and welfare of those who occupy dwelling-houses, if the experience of the factory can be made of any value in the construction of the dwelling. In relating this experience I may again rightly declare that I can give no scientific explanation of the facts. What I shall state will simply be a narrative of facts.

First, it has been the conviction of the executive officers of the Factory Insurance Companies for many years that no material can be made use of which is so complete a non-conductor of heat as solid wood, when used in sufficient mass. This is now becoming the conviction of most of our members, although some of them still adhere to what we can only call a superstition, in favor of an air-space, even in a roof of which the principal part is composed of thick plank. We admit the non-conducting qualities of an air-space, provided it can be hermetically sealed or very nearly so; but this cannot be accomplished in the construction of a roof, therefore when it is proposed to make a roof of two-inch plank, one-inch air-space and one-inch sheathing, we advise either three-inch solid plank, or that the sheathing be nailed close to the under side of the two-inch plank between the timbers and crossway to the lines of the plank. We hold that in this way the non-conduction of heat will be more than equal to the other, and there will be no danger of the humidity generated in the building passing into the air-space and there condensing to the gradual deterioration both of the plank and of the sheathing.

Second, it has been conclusively proved that a solid *deck* made of three-inch plank grooved and splined, flat or with a rise not exceeding half an inch to the foot, will shed water as well as a pitched roof, and will *not* accumulate snow in so great a measure as the roofs of irregular form with many valleys, even if covering a building four hundred feet long and two hundred feet wide with crossway monitors or lanterns for light and ventilation at every other bay—the bays being either eight feet or ten feet four inches in width, as the heavy timbers of the frame may be placed.

Third, the suggestion that the heating of such buildings by means of steam-pipe would be secured in the most perfect and least costly manner, by hanging the pipes *overhead,* away from the side walls, rather than by placing them below the windows along the side walls, is now so fully and generally accepted as to be no longer an open question.

I mention this fact in regard to the starting point of the heat from overhead by artificial methods in order to illustrate the unsuitable character of the crazy roofs which I have described.

The crazy roof bears a very close analogy to the "Sun Heater," and we will consider it by analogy. It consists first of the rafters,

say eighteen inches on centres eight to ten inches deep. These rafters are supported at the upper end against a board which cuts off the connection at the top, between one side of the roof and the other in very many or most cases. On the outside unmatched boards are nailed with many and wide cracks between them. These boards are then covered with shingles. The interior is sometimes back-plastered between the rafters — more often plastered directly upon the rafters. Slates may be counted out, as they are now seldom used in country houses, but the shingles are apt to be painted a dark color. When a great expanse of roof of this sort is exposed to the hot southern sun there is little doubt that the interspace, between the boarding and the plastering, becomes excessively hot; the dark color of the shingles attracts the heat, and they being very thin the heat passes through, and then passes between the cracks of the boarding, and may be said to accumulate in the interspace as in the "Sun Heater."

It would be interesting to have a series of observations taken with the thermometer under these conditions. According to our experience in the observation of factories it would be found that the heat in this interspace, on a bright hot summer day, would be very nearly equal to that of the direct heat of the sun's rays. The air would thus be expanded in the interspace and the passage to the back side of the roof being cut off by the ridge-pole or ridge-board previously named, the expansion will force the heat downward through the interspaces in the vertical walls of the house, thus converting the house into an oven completely heated from the air-spaces in roof and wall.

We infer that this course will be taken by the heat by analogy with the overhead system of heating; for instance, in practice it has been found that a basement of a mill furnished with a stone floor had been so cold to the feet of the operatives while the pipes were at the sides of the room as to be unfit for use, and has been made perfectly comfortable in all respects when the same pipes were placed overhead and a chance was given for bottom ventilation, the heated air from above forcing the cold air out and warming both the room and the floor.

My theory, which is justified by my observations in my own house, is this: The air-space in the roof, instead of obstructing the passage of heat as a two-inch plank plastered solid inside would do, serves to accumulate heat which expands and forces its way downward in the air-spaces of the walls.

In winter the heat generated within the house passes through the plastering into the vertical air-spaces in the wall, passes up to the air-spaces of the roof and out through the cracks of the boards and shingles; this current serves to suck in cold air from below or the foul air from the cellar into the air-spaces of the walls and of the roof.

Thus, the only effective non-conducting substance is the plastering — all the boards both of roof and walls failing for want of being thick enough or tight enough to serve a useful purpose as non-conductors.

If this theory is well grounded these air-spaces, which are not hermetically sealed, are a snare and a delusion. Who really knows whether this is so or not? What architects have made any observations? What hollow-walled or "air-spaced" wooden house is equal to a log house in this matter?

Now, in the construction of the crazy roof a sufficient quantity of wood is used in the rafters and the boards to serve for the covering of a well-planned hipped roof over the same number of superficial feet, with plank two inches thick, grooved and splined. If such plank be laid on timbers placed five feet on centres and protected within by a single coat of plastering laid solid against the plank between the timbers, the attic may be made the coolest room in the summer and the warmest room in winter — instead of being converted into an oven in summer and a refrigerator in winter, according to the common custom.

Yet better, if upon such a hipped roof, the plastering be laid outside in the form of a half-inch coat of mortar and then shingled over the mortar, the shingles themselves will last about twice as long and the roof itself will even be a better non-conductor of heat than when constructed in the other way.

I submit these views for just what they are worth, with the hope that in view of the great progress which is being made by sensible architects toward safe and suitable construction, these lessons derived from the factory may be considered.

But there is one other point to which I desire to call attention. We have become accustomed to forms of roof on country dwelling-houses which were the necessary forms so long as there was no suitable covering for a flat roof in existence; but so far as I have read, I observe, without ever having visited Eastern hot countries, that the customary roof in all hot climates is a thick *flat* roof, which is made use of as a place of resort in hot summer evenings for air and recreation. It seems to me that in the close suburbs of cities where small dwelling-houses must of necessity be placed on small lots of land, that there is a great waste of opportunity for lack of consideration of the merits of flat roofs. In place of the one or two story dwelling-houses covered by the crazy roof, why might not the house be covered with a deck, that deck being covered with painted duck like the deck of a steamboat, so that it could be used as a place of resort for relief from the heat during our intense summer weather?

We have the record of a part of a duck mill in Plymouth which had been covered with painted duck for twenty-seven years, and when the mill was taken down the duck roofing was in as good condition as when first put on. If duck is placed upon crazy roofs the humidity will pass from the house through the cracks and rot it in the under side; but if properly placed over a well-constructed flat deck it may be kept in good condition longer than almost any other material. And if such a deck-roof is suitable for the small dwelling-house, why not for the larger dwelling-house, even where there is plenty of land? Is there anything against it except appearances? Are not appearances against it merely because we have become habituated to other forms?

May it not be the function of the true architect to evolve a dwelling-place which shall be suitable to the conditions of climate in which we live? Of such a dwelling a thick deck-roof would be in all but appearance the very best.

Cannot the true architect give breadth, repose and comfort to some form of structure which will make the roof the pleasantest place in the hot summer evening?

Why waste such a place upon the crazy roof which covers the crazy shingle palace of these modern days?

In order that the analogy between the common roof and the sun-heater may be fully comprehended, I have added a diagram of the latter, which has been kindly furnished by Professor Morse. Permit me to call the attention of architects to the probably great value of this invention, for which Professor Morse holds the patent, in its application to churches. If placed on the south side it will be likely to work three or four sunny days in each week, and on each day that it works the air of the church will be changed several times a day, — the advantage is apparent.

Yours truly, EDWARD ATKINSON.

NOTES AND CLIPPINGS.

A QUEER SUPERSTITION. — Abram Reed, a farmer living in Beaver township, Pa., cut down a large oak tree on his farm, and in cutting it up he found, imbedded in the trunk, seven or eight feet from the ground, a small glass bottle and what had the appearance of a lock of hair. The bottle had been inserted in a hole in the tree made by an auger, then a pine plug was driven into the hole over the bottle, the hair also being held in the hole by the plug. The bottle was corked, and contained a colorless liquid. Over the plug had grown six solid rings of wood, beside the thick bark. There was a superstition among the early settlers, and it is held by many of their descendants, that asthma and other affections could be cured by the victim standing against a tree and having a lock of his hair plugged in it while the hair was still attached to his head. It must then be cut off close to his head, and the afflicted person walk away without looking at it or ever passing by the tree again. While the use of a bottle was not included in this treatment, it is believed that the one with the hair discovered in the heart of the oak tree was put there in the early days of the settlement by some believer in the superstition to cure an ailment of some kind. — *Lumber World.*

FRESCOES FOUND IN ROME. — Archæological discoveries of importance are rapidly succeeding each other here. That within the limits of the Temple of Vesta illustrating the rites performed there has been followed by another, made within the distance of a few yards, connected with the Christian Church and the ecclesiastical history of the tenth century (*circa*). It will be remembered that immediately behind the remains of the Temple of Castor and Pollux, and adjoining the Church of Santa Maria Liberatrice, there stand the colossal walls of an edifice of brickwork of the finest imperial construction. What it was no one ventured to pronounce. The late Mr. J. H. Parker maintained that one of the walls belonging to it was part of the celebrated bridge built by Commodus across the Forum from his *domus* on the Palatine to the Temple of Jupiter Capitolinus. Others have thought that these walls might be the remains of the temple dedicated to Augustus, which was somewhere in this vicinity. But these theories must be dismissed, together with others propounded in times past. Within and against the walls of this mysterious relic of imperial magnificence a number of hay-lofts have been built, hiding them almost entirely, except where they towered above the modern roofs. These hay-lofts, the ground floors of which were occupied by wrights and carpenters, are now in process of being demolished. Already the area of one great hall, with large niches for statues in it, and far exceeding in dimensions and grandeur any of the remains of the Forum adjoining it or of the Palace of the Cæsars above it, has been cleared. It was soon seen that the flooring almost corresponding with the modern level was of recent date. It was cut through. The original flooring was found at a depth corresponding with the level of the Forum itself. One-half of this hall has been further cleared down to that level, and from it opens a passage, the walls and ceiling of which are covered with comparatively uninjured fresco paintings representing Christian saints standing in rows on one side and the other, while on the face of the wall of the hall itself are remains of similar frescoes, indicating that it had been completely decorated in the same manner. The Commendatore de Rossi attributes these frescoes to the tenth or eleventh century, but for the present reserves any further opinion beyond that which he put forth in a tentative manner, with reference in part proof of it in a paper written by him on the eight hundred Anglo-Saxon coins discovered in a jar two years ago close to the House of the Vestals. This opinion was to the effect that at the time those coins were sent to Rome the imperial buildings along that side of the Palatine were occupied by the Pontiffs as their residence and by the officers of the ecclesiastical Government as the Vatican is now. We must wait for the completion of Signor de Rossi's studies and researches regarding this interesting subject. But in the meantime one may be tempted to suppose that we see in this wall of an unknown edifice of one of the first Cæsars the hall, perchance, of the Consistory of the time of Alfred the Great, whose money was found near it. The completion of the excavations will, it is hoped, throw full light on the original nature of this grand edifice of pagan Rome and the later use to which it was applied in Christian days. — *Rome Dispatch to the London Times.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

317,265. METHOD OF PREVENTING THE FORMATION OF ICE ON SHOW-WINDOWS.—Edwin A. Wood, Utica, N. Y.

317,294. CHIMNEY-CAP.—Charles W. Carll, Camden, N. J.

317 321. SASH-FASTENER.—Patrick J. Donohue, Chicago, Ill.

317,333. COMBINED WASH AND BATH TUB.—Julia B. French, Boston, Mass.

317,337. METHOD OF REPAIRING WITH BETON OR CONCRETE.—John C. Goodridge, Jr., New York, N. Y.

317,338. PROCESS OF CONSTRUCTION AND REPAIR WITH BETON OR CONCRETE.—John C. Goodridge, Jr., New York, N. Y.

317,351. BRICK-KILN.—Thos. S. Hawkins, Chattanooga, Tenn.

317,352. HOLDER FOR SLIDING-DOORS.—William E. Haycox, Cleveland, O.

317,373. WASTE-PIPE FOR WASH-BASINS, BATH-TUBS, ETC.—Oliver H. Keep, New York, N. Y.

317,381. IRON ROOFING.—William C. Langenau, Cleveland, O.

317,398. LOCK.—Philip Mathes, Idlewood, Pa.

317,410. SPRING-HINGE.—Sidney S. Niles, Chicago, Ill.

317,414. DEVICE FOR FASTENING ROOF-TILES.—Fawcett Plumb, Streator, Ill.

317,440. PROCESS OF PRESERVING WOOD.—Joseph P. Card, St. Louis, Mo.

317,456. WINDOW-SCREEN.—Alexander H. Hill, Oskaloosa, Iowa.

317,485. WINDOW-AWNING.—Thomas L. Barlow, Boston, Mass.

317,496. DOOR-HANGER.—Charles W. Bullard, Chicago, Ill.

317,505. FLUSH-TANK FOR WATER-CLOSETS, SEWERS, ETC.—Winfield S. Chaplin, Schenectady, N. Y.

317,517. COMBINED STRAIGHT-EDGE AND GAUGE.—Milo Covel, Chicago, Ill.

317,524. HOLLOW AUGER.—George W. England, Merrimac, Mass.

317,531. FIRE-ESCAPE.—Christopher Hoell, St. Louis, Mo.

317,540. FASTENING FOR MEETING-RAILS OF SASHES.—Hobart B. Ives, New Haven, Conn.

317,547. LOCK.—Thomas Kirwan, Boston, Mass.

317,548. PINCH-BAR.—Charles Klaus, Chicago, Ill.

317,550. PENCIL-SHARPENING MACHINE.—Warren H. Lamson, Lynn, Mass.

317,564. ELEVATOR-HATCHWAY GUARD.—Walter S. Morton, St. Paul, Minn.

317,613. LAG-SCREW FOR PIPE-HANGERS.—George W. Blake, New York, N. Y.

317,630. DOOR SADDLE OR SILL.—James A. Cramer, Morristown, N. J.

317,631. DISINFECTING WATER-CLOSETS.—William M. Ernst, New York, N. Y.

317,659. WINDOW-SASH.—Emil R. Mayer, New York, N. Y.

317,684. FLOOR-TUBE.—Abel G. Stilson, Cobleskill, N. Y.

317,701. REVERSIBLE HINGE.—Jacob F. Aston, Watsonville, Cal.

317,704. FIRE-ESCAPE.—Edmond Beale and Andrew Bangs, Philadelphia, Pa.

317,710. FLOAT-VALVE FOR WATER-CLOSETS.—August F. Blesch, Columbus, O.

317.715. REAMER.—Jesse H. Brown, Syracuse, N. Y.

317,717. WATER-CLOSET.—William Bunting, Jr.,

SUMMARY OF THE WEEK.

Baltimore.

WAREHOUSE.—Chas. L. Carson, architect, has prepared plans for the McCreery Building, which will front 100′ on Sharp St., 110′ on German St., and 74′ on Liberty St., be built of brick, stone and iron, six stories and basement; cost, $150,000; W. T. Markland & Bros., builders.

BUILDING PERMITS.—Since our last report forty permits have been granted, the more important of which are the following:—

Geo. H. Strott, three-st'y brick building, w s Parrish Alley, between Mosher and Tennant Sts.

David Kruse, three-st'y brick building, w s Parrish Alley, between Mosher and Tennant Sts.

B. Baron, one-st'y brick building, e s Pratt St., between Exeter and Canal Sts.

Jas. L. Bowen, 16 two-st'y brick buildings, s e s Bowen St., s w from Cross St.

E. Pohl, 2 three-st'y brick buildings (square), w s Diamond St., between Saratoga and Mulberry Sts.

F. D. Forrester, 3 three-st'y brick buildings, w s McCulloh St., commencing n w cor. Robert St.; and 2 three-st'y brick buildings (square), n s Robert St., w of McCulloh St.

S. H. Lucas, three-st'y brick building, n s Pierce St., between Pine and Pearl Sts.

W. T. Phillips, 7 three-st'y brick buildings, w s Gilmore St., n of Baltimore St.

S. B. Seaton & Co., three-st'y brick building, n s Barre St., between Greene and Warner Sts.

Henry Schamburg, 5 two-st'y brick buildings, w s Russell St., between Cross and Hamburg Sts.

A. A. Rinehart, 5 three-st'y brick buildings and mansard, w s Eutaw Pl., between North Ave. and Bloom St.

G. C. Herschman, 27 two-st'y brick buildings, w s Patterson Park Ave., between Orleans and Jefferson Sts.

L. O. Chappell., three-st'y brick building, n s Mulberry St., between Pearl and Pine Sts.

Morgan & Bro., 8 two-st'y brick buildings, e s Etting St., s of Bloom St.

Henry Lange, 4 two-st'y brick buildings, w s Chester St., between Eager St. and Union Railroad.

Boston.

BUILDING PERMITS.—*Brick.—Wellington St., No.* 26, apartment-house, 24′ and 27′ x 53′; owner and builder, Geo. S. Hewitt.

South St., No. 143, mercantile, 78′ 8″ x 105′ 2″; owner and builder, J. F. J. Faxon.

Beach St., No. 114, mercantile, 73′ 7″ x 91′ 9″; owner and builder, same as last.

Cabot St., No. 131, cor. Weston St., tenement, 55′ x 30′ and 67′; owner, John Nichols; builder, Fajah Jackson.

Endicott St., Nos. 183-187, cor. North Margin St., 3 dwells., 21′ 6″ x 35′; owner, D. McLaughlin.

Hampden St., Nos. 106 *and* 108, dwell. and store, 22′ x 43′; owner, John Y. Supple; builder, James Small.

Isabella St., tenement, 42′ x 60′; owner, H. M. Currier.

Brooklyn.

BUILDING PERMITS.—*Broadway*, s e cor. Adams St., three-st'y brick office, salesroom and refrigerating-building, tin roof; cost, about $7,000; owner, E. C. Swift, Lowell, Mass.; architect, S. E. Goodrich; builder, B. F. Bailey.

Jefferson St., Nos. 132 *and* 134, s e s, 225′ n e Central Ave., 2 three-st'y frame tenements, tin roofs; cost, each, $3,800; owner and builder, Casp. Gossmann, 138 Ellery St; architect, E. Schrampf.

Greenpoint Ave., No. 209, three st'y frame tenement (brick-filled), tin roof; cost, $3,500; owner, Peter Dougherty, 209 Greenpoint Ave.; builder, D. O'Keefe; architect, F. Holmberg.

De Kalb Ave., n s, 330′ e Raymond St., three-st'y attic brick and Pleasant Valley brown-stone mission and dwell., metal and slate roof; cost, $3,500; owner, A. A. Low, 3 Pierrepont Pl.; architects, Parfitt Bros.; builder, L. W. Seaman.

Sullivan St., s s, 80′ e Richard St., 2 three-st'y frame tenements, tin roofs; cost, $6,650; owner, T. Gerrethe, on premises; architect and contractor, C. M. Detlfsen; mason, T. Kelly.

Fifth Ave., n w cor. President St., 4 three-st'y brick dwells. and tenements, gravel roofs; cost, $30,000; owner and mason, Wm. Corrigan, 233 Eleventh St.; architect and contractor, P. Corrigan.

Nostrand Ave., e s, 54′ 1″ n Atlantic Ave., 3 two-st'y brown-stone dwells., tin roofs; cost, each, $4,000; owner, James O. Carpenter, 120 New York Ave.; architects, Geo. P. Chappell & Co.; builders, J. Ashfield & Son and Powderly & Murphy.

Macon St., s s, 309′ e Nostrand Ave., three-st'y brick dwell., slate and tin roof; cost, $8,000; owner, Frank Seaman, 182 Rodney St., architect, A. O. Hoddick; builder, W. J. Moran.

Clark St., Nos. 551-555, n s, 100′ from Hicks St., eight-st'y hotel and apartment-house, mansard roof; cost, $170,000; owner, W. Tumbridge, 78 Hicks St.; architect, A. Hatfield.

Schenck St., w s, 100′ n Myrtle Ave., two-and-a-half-st'y frame (brick-filled) dwell., gravel roof; cost, $4,000; owner, Frank Ward, 375 Myrtle Ave.; architect and builder, J. T. Hanlon.

Throop Ave., w s, 23′ n Lexington Ave., 4 two-st'y brick dwells., tin roofs, wooden cornices; cost, $15,000; owner and builder, John McDikken, 282 Marion St.

India St., No. 86, s s, e of Franklin St., three-st'y frame (brick-filled) tenement, gravel roof; cost, $5,000; owner and contractor, Dennis Devine, on premises; architect, F. Weber; mason, J. Hafford.

St. Mark's Ave., s s, about 125′ w New York Ave., three-st'y brick and stone dwell., slate and tin roof; cost, about $15,000; owner, Wm. H. Addoms, Cliff St., New York; architect, H. P. Fowler; builders, Jas. Ashfield & Son and Morris & Selover.

Adams St., w s, 80′ n Myrtle Ave., five-st'y brick police court house, tin and slate roof; cost, $45,228; owner, City of Brooklyn; architects, Parfitt Bros.; builder, P. J. Carlin.

Dean St., n s, 95′ e Washington Ave., three-st'y brick armory-building, tin roof; cost, about $50,000; owner, King's County; architect, R. Dixon; builders, H. D. & W. A. Southard.

Quincy St., n s, 85′ e Reid Ave., 12 two-and-a-half-st'y brown-stone dwells., tin roofs; cost, each, $5,500; owner, Mrs. R. Gill, 201 Keap St.; builder, J. Roper.

Reid Ave., n e cor. Hancock St., three-st'y brown-stone store and dwell., tin roof; cost, $12,000; owner, Chas. H. Althaus, 466 Carlton Ave.; architect, Carl F. Eisenach; builders, J. J. Gallagher and F. D. Norris.

Monroe St., n s, 100′ e Lewis Ave., three-st'y brick dwell., tin roof, wooden cornice; cost, $4,800; owner, Mrs. Marcia De Castro, 257 Lewis Ave.; architect, J. S. Stevens; builder, M. Reynolds.

Bushwick Ave., No. 200, e s, 60′ s Ten Eyck St., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,500; owner and builder, Joseph Amrein, on premises; architect, Th. Engelhardt.

Park Ave., n e cor. Carlton Ave., 3 four-st'y brick stores and tenements, tin roofs; cost, $18,700; owner, L. M. Goldrick, 95 Clinton St.; architect, M. J. Morrill; builders, P. J. Carlin and Long & Barnes.

Central Ave., No. 33, e s, 30′ n Prospect St., three-st'y frame tenement, tin roof; cost, $4,300; owner, Joseph Wendel, 34 Central Ave.; architect, Th. Engelhardt; builder, D. Kreuder.

Third Ave., e s, 20′ 2″ s Thirty-eighth St., 2 four-st'y brick tenements, tin roofs, wooden cornices; cost, each, $8,500; owner and architect, John H. O'Rourke, 119 Thirty-eighth St.; builders, John Anderson and J. H. O Rourke.

Chicago.

BUILDING PERMITS.—J. Hulka, two-st'y store and dwell., 911 West Nineteenth St.; cost, $3,800.

J. H. Wilson, two-st'y dwell., 31 Brown St.; cost, $4,000.

J. Koch, two-st'y dwell., 3153 Wentworth Ave.; cost, $4,500.

Church of the Epiphany, one-st'y church, Ashland Ave. and Adams St.; cost, $50,000.

S. Sutter, three-st'y store and flats, 395 Ogden Ave.; cost, $5,000; architect, Wm. Strippelman.

T. O'Connell, two-st'y dwell., 87 McAllister Pl.; cost, $5,000; architect, W. H. Drake.

C. Gevne, three-st'y flats, 143 Erie St.; cost, $10,000; architect, H. Hanson.

C. H. Holenberg, three-st'y dwell., 263 West Ohio St.; cost, $3,500.

J. Lohstein, two-st'y dwell., 404 to 406 Morgan St.; cost, $5,000.

Wm. Wagner, three-st'y dwell., 251 Bissell St.; cost, $6,000.

Mrs. M. T. Topping, two-st'y store and dwell., 405 West Randolph St.; cost, $3,500.

N. Eckhardt, three-st'y store and dwell., 448 West Chicago Ave.; cost, $9,000.

J. F. Sheridan, 2 two-st'y dwells., 481 to 483 Ashland Ave.; cost, $9,000.

J. H. Webber, three-st'y store and dwell., 471 Larrabee St.; cost, $6,000.

E. Klein, three-st'y store and dwell., 791 Halsted St.; cost, $10,000.

J. & P. A. Otis, five-st'y store and flats, 294 Clark St., cost, $15,000; architect, T. V. Wadskier.

M. Hayes, two-st'y dwell., 2117 Wabash Ave.; cost, $3,000.

Mrs. R. Heacon, two-st'y dwell., 787 Monroe St.; cost, $5,000; architect, H. Copeland.

A. Kaler, two-st'y dwell., 646 Nineteenth St.; cost, $2,800.

J. Rezek, two-st'y dwell., 757 Loomis St.; cost, $2,900.

Mrs. H. Mathison, three-st'y flats, 61 West Huron St.; cost, $6,000; architect, G. Isaacson.

Mrs. A. Rennie, two-st'y store and dwell., 921 West Twenty-second St.; cost, $2,800.

M. Blake, two-st'y dwell., 589 Taylor St.; cost, $3,300; builder, M. Hanley.

C. Munostock, three-st'y store and dwell., 150 Bissell St.; cost, $5,000; architect, Thomson.

O. Smith, three-st'y dwell., 41 Bellevue Ave.; cost, 8,000; architects, Treat & Foltz.

Sage & Sullivan, two-st'y barn, 210 to 212 Chicago Ave.; cost, $3,200.

G. Fachs, two-st'y dwell., 605 Dearborn Ave.; cost, $10,000.

S. P. Redfield, two-st'y dwell., 54 Thirty-fifth St.; cost, $7.000; architects, Treat & Foltz.

N. Johnson, two-st'y dwell., 717 Maplewood Ave.; cost, $2,500.

C. H. Fuller, two-st'y dwell., 370 Warren Ave.; cost, $6,000; architect, C. C. Miller.

A. Lemington, two-st'y dwell., Oak Ave.; cost, $3,500.

Wm. McAuliffe, two-st'y dwell., 378 Fourteenth St.; cost, $3,000.

M. Griffiths, 2 two-st'y dwells., 289 Leavitt St.; cost, $6,000.

C. Hagensen, two-st'y dwell., 186 Evergreen Ave.; cost, $2,500.

H. A. Hansen, three-st'y dwell., 36 Evergreen Ave.; cost, $6,000.

J. J. Phelan, three-st'y store and dwell., 316 Twelfth St.; cost, $8,000; architect, P. W. Ruehl.

G. P. Brown, two-st'y dwell., 672 Lasalle Ave.; cost, $15,000; architect, L. G. Halberg.

H. S. McLean, 2 two-st'y dwells., 100 to 102 Laflin St.; cost, $7,000; architect, C. C. Miller.

T. Biddle; four-st'y store and flats, 188 to 190½ North Clark St.; cost, $20,000; architect, E. Baumann.

M. Quinn, two-st'y store and dwell., 1231 Western Ave.; cost, $4,600.

T. J. Myers, two-st'y addition, 3815 Ellis Ave.; cost, $4,000.

C. B. Farwell, four-st'y addition, Jackson and Halsted Sts.; cost, $15,000.

Breyeha & Long, 2 three-st'y dwells., 104 to 100 Bunker St.; cost, $8,500.

F. Rozlik, three-st'y dwell., 292 Fourteenth St.; cost, $6,500.

H. Ramaker, two-st'y dwell., 636 West Harrison St.; cost, $5.000.

D. H. Hammar, two-st'y dwell., Thirty-seventh St. and Grand Boulevard; cost, $15,000.

E. Johnson, three-st'y dwell., 232 May St.; cost, $6,000.

J. A. Sexton, two-st'y dwell., 561 Lasalle Ave.; cost, $5,000; architect, S. M. Randolph.

J. Schroer, two-st'y dwell., 2918 Honore St.; cost, $8.000.

P. Mattes, three-st'y flats, 415 Belden St.; cost, $5,000; architect, D. F. Holz.

B. Stucker, three-st'y flats, 319 Lincoln Ave.; cost, $6,000; architects, Furst & Rudolph.

G. Lindholm, two-st'y barn, 356 Indiana St.; cost, $2,500.

J. A. Raap, two-st'y dwell., 618 North Hoyne Ave.; cost, $15,000; architect, H. Kley; builder, W. Mueller.

Cook & Hill, 2 two-st'y dwells., 3259 Groveland Pk.; cost, $12,000; architect, J. N. Tilton.

Wm. Powers, two-st'y dwell., 203 Chestnut St.; cost, $1,000; architect, J. Otter.

J. Eldenwick, three-st'y dwell., 172 Fourth Ave.; cost, $5,000; architect, G. Vigeant.

Geo. Arnold, two-st'y dwell., 208 Lasalle Ave.; cost, $5 000.

Cincinnati.

BUILDING PERMITS.—C. H. Gould, 2 two-st'y frame buildings, Lane St.; cost, $5,000.

Jos. Austermohr, three-st'y brick building, Liberty St.; cost, $7,000.

C. Windisch, three-st'y brick building, Sixth St., near Smith St.; cost, $6,000.

Henry Boenforder, two-st'y brick building, s s Dayton St.; cost, $6,000.

H. Sahlfeld, Main St., opposite Abigail St., five-st'y brick building; cost, $6,000.

Richter & Co., Ninth St., between Sycamore and Main Sts.; cost, $8,000.
Repairs and additions, costing $2,500.
Total permits to date, 315.
Total cost to date, $1,256,500.

Kansas City, Mo.

Building Permits. — M. Dircky, brick house, 616 West Tenth St.; cost, $3,000.
P. H. Smith, brick house, Wyandotte St.; cost, $3,000.
Stump & Peltzer, block of six brick houses, two-and-one-half-st'y; cost, $15,000.
O. C. Day, brick house, cor. Ninth St. and Forest Ave.; cost, $6,500.
George M. Myers, brick and terra-cotta house; cost, $10,000.
D. O. King, brick house, Baltimore Ave.; cost, $4,000.

Minneapolis, Minn.

Building Permits. — James Pauly, three-st'y brick and stone hotel building, High St. and Bridge Sq.; cost, $12,000.
Henry Downs, two-and-one-half-st'y double wooden dwell., n w cor. East Seventeenth St. and Park Ave.; cost, $7,500.
J. H. and J. W. Paul, two-st'y brick store building, w cor. Twentieth St. and Eighth Ave., n; cost, $4,000.
Cook Bros., brick store and office building, cor. Fifth street and Hennepin Ave.; cost, $100,000.
M. V. Kinney, two-st'y wooden dwell. and barn, Stevens Ave., bet. East Thirty-first and East Thirty-second Sts.; cost, $4,800.
Alice M. Spink, 5 two-st'y brick stores and flats, cor. Fifth St. and Cedar Ave.; cost, $10,000.
Andrew Bergstrom, two-st'y wooden dwell., e s Ninth St., cor. Sixteenth Ave., s; cost, $3,000.
Chester Simmons, two-st'y wooden dwell., s w s Seventh Ave., s, bet. Nineteenth and Twentieth Aves.; cost, $7,000.
J. S. Sinnott, two-st'y dwell., cor. Sixth Ave. and Eighteenth St.; cost, $4,000.
James Pye, two-st'y double dwell., cor. Birch and Tenth St., n; cost, $3,500.
Ole Oleson, two-st'y double brick store, Plymouth Ave., bet. Fifth and Sixth Sts., n; cost, $8,000.
Judge M. B. Coon, two-st'y brick store, cor. Franklin and Twelfth Ave., s; cost, $4,500.
Edward Hanson, addition to hotel, 353 and 355 Fourth Ave., n; cost, $4,000.
Donald Kennedy, two-st'y brick dwell., Park Ave., bet. Twenty-second and Twenty-fourth Sts.; cost, $28,000.
Mrs. G. E. Foster, two-st'y wooden dwell. and barn, Talmage Ave. and Thirteenth St., s e; cost, $6,000.
R. L. Stillman, brown-stone store and office building, 19, 21, and 23 Fourth St., s; cost, $80,000.
W. T. Collum, five-st'y brown-stone store and office building, 25, 27, and 29 Fourth St., s; cost, $60,000.
S. M. Klarquist, two-st'y brick veneer dwell., Fifteenth Ave., bet. East Nineteenth and Twentieth Sts.; cost, $5,000.
Campbell Bros., two-st'y wooden dwell. and barn, cor. Aldrich Ave. and West Twenty-fifth St.; cost, $4,900.
C. A. Anderson, two-st'y wooden dwell., Hennepin Ave., bet. West Twenty-seventh and Twenty-eighth Sts.; cost, $3,500.
E. G. Falk, two-st'y dwell. and barn, First Ave., bet. East Thirty first and East Thirty-second Sts.; cost, $3,700.
Howard A. Hinkle, four-st'y brick store building and warehouse, 66' front, n e s Second St., bet. Second and Third Aves.; cost, $30,000.

New York.

The New Building Law. — The Mechanics' and Traders' Exchange, at a special meeting held last week, appointed a committee of five to wait on Governor Hill and protest against the building law as passed by the legislature.
Hotel. — The Buckingham Hotel, on the s e cor. of Fifth Ave. and Fiftieth St., is to be extended, at a cost of $175,000, for the owner, Mr. Geo. Kemp.
Stores. — The Trinity Church Corporation will have erected, from plans of Mr. Chas. C. Haight, 5 three-st'y and cellar buildings, on the s e cor. of Varick and King Sts.
Building Permits. — *West Thirtieth St., No.* 526 five-st'y brick tenement, tin roof; cost, $14,000; owner, architect and builder, Thos. P. Dunne, 364 West Fifty-first St.
Thirty-fourth St., s s, 125' e Twelfth Ave., two-st'y brick stable and loft, gravel roof; cost, $4,000; owner, N. Y. Packing Co. (Limited) on premises; builders, Marc Eidlitz & Son.
East Forty-fourth St., No. 215, five-st'y brick brown-stone front tenement, tin roof; cost, $9,000; owner, Mary E. Taylor, 217 East Forty-fourth St.; architects, A. B. Ogden & Son.
Forty-eighth St., n s, and *Forty-ninth St.*, s s, 81' 6" e Tenth Ave., 2 five-st'y brick tenements, tin roofs; cost, each, $10,000; owner, Wm. Rankin, 332 West Forty-seventh St.; architect, M. Louis Ungrich.
West Fiftieth St., No. 363, five-st'y brown-stone front flat, tin roof; owner, John Buckle, 363 West Fiftieth St.; architect, R. H. Bschaidner; builders, John P. Schweikert and Muller & Dorfler.
Fifty-seventh St., n s, 175' w Ninth Ave., one-st'y and basement brick church, slate roof; cost, $25,000; owner, John S. Davenport, 15 West Eleventh St., and another; architect, F. H. Kendall.
Forty-first St., s s, 275' e First Ave., iron gas-holder (tank); cost, $21,000; owner, Equitable Gas-Light Co., 310 Third Ave.; architect, John F. Harrison; builder, John T. Rowland.
Forty-eighth St., Nos. 328 *and* 330, 2 five-st'y brick tenements, tin roofs; cost, each, $17,000; owner, Alfred Brumme, 419 East Twenty-third St.; architect and builder, Wm. Stauffer.
West Forty-ninth St., No. 414, five-st'y brown-stone front tenement, tin roof; cost, $14,000; owner, Adelia Kirschhoffer, 414 West Forty-ninth St.; architect, Jobst Hoffmann.
West Fifty-fourth St., Nos. 431, 433, 435 *and* 437, 4 five-st'y brick tenements, tin roofs; cost, each, $16,000; owner, Philip Hauseman, 522 West Forty-ninth St.; architect, M. L. Ungrich.
Fifty-ninth St., s s, 210' w Second Ave., 2 five-st'y brick tenements and stores, tin roofs; cost, each, $18,000; owner, John Murphy, 249 East Forty-ninth St.; architects, Thom & Wilson.
First Ave., w s, 75' e Twenty-third St., five-st'y brick tenement and store, tin roof; cost, $17,500; owner, John Kreeb, 471 First Ave.; architects, Thom & Wilson.
Sixth Ave., Nos. 410 *and* 412, cor. Twenty-fifth St., five-st'y brick flat, tin roof; cost, $28,000; owner, Henry P. Stewart, White Plains, N. Y.; architect and builder, J. C. Miller.
Tenth Ave., n w cor. Thirty-seventh St., five-st'y brick tenement and store, tin roof; cost, $20,000; owner, John Schwarzler, 1365 Fifth Ave.; architects, Thom & Wilson; builders, days' work.
Tenth Ave., w s, 25' n Thirty-seventh St., 2 five-st'y brick tenements and stores, tin roofs; cost, each, $18,000; owner and architects, same as last.
East Fifty-second St., No. 161, five-st'y brick tenement, tin roof; cost, $8,000; owner, architect and builder, Andrew T. Doyle, 211 East Fifty-eighth St.
Fifty-third St., foot of, and East River, two-st'y frame coal-pocket, tin roof; cost, $5,000; architect, D. W. King; builder, John Henry Euler.
Ninth Ave., n w cor. Forty-first St., five-st'y brick tenement and store, tin roof; cost, $15,000; owner, Mrs. Mary J. Gordon, 325 West Forty-sixth St.; architect, James Stroud.
One Hundred and Twenty-second St., n s, 150' e Third Ave., 6 four-st'y brick tenements, tin roofs; cost, each, $12,000; owner and builder, Chas. E. Vantassel, 148 East One Hundred and Twenty-eighth St.; architect, J. H. Valentine.
Alterations. — *West Twenty-third St., No.* 67, two-st'y brick extension, etc.; cost, $10,000; owner, Chas. Kelly Briddon, on premises; architects, J. C. Cady & Co.
Madison Ave., n e cor. Thirtieth St., raise one-st'y, fire-proof; cost, $15,000; owners, Jno. S. Ellis, 139 Front St., and others; architects, Hubert Pirsson & Co.
East Seventy-eighth St., No. 119, general repairs; cost, $3,000; owner, Chas. Rosenbaum, 119 East Seventy-eighth St.; architects, Schwarzman & Buchmann; builder, W. Armstrong.
Cherry St., Nos. 305 *and* 307, raise two stories, etc.; cost, $7,000; owner, S. Ellis Briggs, 249 Cherry St.; builder, Alphonse Gariepy.
Thirty-third and Thirty-fourth Sts., foot of, and East River, one-st'y frame extension, gravel roof; cost, $4,000; owner, East River Ferry Co., on premises; architect, John Brandt.
Third and Fourth Aves. and Seventh and Eighth Sts., take out every alternate pier in first story on Third and Fourth Aves., and replace same by larger ones; cost, $30,000; owner, Cooper Union, Edward Cooper, President, 12 Washington Park; architect, Leopold Eidlitz; builder, Jas. B. Smith.
Washington St., No. 661, raise one-st'y and a five-st'y brick extension, tin roof; cost, $14,000; owner, James Roon, 278 West Tenth St.; architect, Jos. M. Dunn.
Wall St., Nos. 59 *and* 61, take out two cross-walls in first story and put in iron girders; cost, $6,000; owners, Brown Bros. & Co., on premises; architect, Charles W. Clinton; builder, John M. Dodd, Jr.

Philadelphia.

Building Permits. — *McKean St.*, w of Eleventh St., 3 two st'y dwells., 16' x 43'; J. Stuckey, contractor.
School Lane, w of Morris St., three-st'y dwell., 32' x 58'; Geo. Hearst, contractor.
North Twenty-fourth St., No. 760, three-st'y dwell., 17' x 60'; Wm. Leavitt, contractor.
South Second St., No. 47, addition, 30' x 35'; Marriner & Buckingham, contractors.
Twentieth St., below Reed St., 3 two st'y dwells., 15' x 40'; Wm. Forbes, contractor.
Fortieth St., n w cor. Ogden St., 8 three-st'y dwells., 15' x 41'; also, 5 two-st'y dwells., 12' x 30'; W. G. Kimball, contractor.
Second St., above Somersett St., 3 two-st'y dwells., 14' 6" x 45'; H. Bower, owner.
Bodine St., above Huntingdon St., one-st'y dye-house, 37' x 50'; H. Shadwald.
Newbold St., above Wood St., addition to factory, 30' x 45'; J. Eavenson & Son, owners.
Poplar St., above Fourth St., 2 three-st'y dwells., 15' x 24'; W. Lehman, contractor.
Columbia Ave., above Twenty-seventh St., 25 three-st'y dwells., 15' x 55'; J. E. Ridgway.
Thirty-eighth St., above Aspen St., 9 three-st'y dwells., 15' x 50'; H. Pettit, owner.
Swayne St., w of Twenty-seventh St., 6 two-st'y dwells., 14' x 34'; W. Charleton, owner.
Mechanic St., above Morton St., 8 two-st'y dwells., 14' x 28'; D. P. Brunner.
Wharton St., w of Thirty-first St., 7 two-st'y dwells., 18' x 46'; W. Thompson & Bro., contractors.
Woodland Ave., No. 481, three-st'y dwell., 18' x 50'; John Welsh, owner.
Girard Ave., w of Twenty-ninth St., 25 two-st'y dwells., 16' x 46'; Elkins & Co., owners.
Canal St., above St. John St., three-st'y factory, 20' x 79'; W. H. Bilyen, contractor.
Chestnut St., Nos. 121, 133 *and* 125, 3 four-st'y stores, 26' x 73'; I. A. Bradin, contractor.
Snyder Ave., w of Tenth St., 10 two-st'y dwells., 16' x 43'; A. Miller, contractor.
Race St., No. 309, three st'y store, 20' x 40'; Geo. D. Ellis & Sons.
Fifteenth St., above York St., 4 three-st'y dwells., 16' x 56'; Jno. Holton, owner.
Summer St., w of Thirty-second St., 10 two-st'y dwells., 16' x 45'; Wendell & Smith, owners.
Columbia Ave., w of Twenty-fifth St., 7 three-st'y dwells., 14' x 55'; J. L. Carre, owner.
Vienna St., No. 1618, three-st'y dwell., 18' x 42'; D. J. Getz, owner.
Elm Ave., No. 4120, 4 three-st'y dwells., 20' x 56'; H. Grau, contractor.
Knox St., above Manheim St., two-st'y dwell., 18' x 51'; B. P. Evans, contractor.
Montrose St., w of Sixteenth St., 2 two-st'y dwells., 17' x 28'; W. Crawford, contractor.
Thirty-eighth St., cor. Locust St., 6 three-st'y dwells., 20' x 55'; A. B. Rorke, contractor.
Girard College Grounds, one-st'y shop, 30' x 66'; A. B. Rorke, contractor.
Wharton St., w of Fifteenth St., four-st'y factory, 53' x 103'; A. Beck, contractor.
Marston St., above Columbia Ave., 8 two-st'y dwells., 15' x 39'; J. E. Ridgway, owner.
Clearfield St., No. 320, two-st'y dwell., 16' x 38'; E. L. Baldt, owner.
Emerald St., cor. Alleghany Ave., three-st'y dwell., 20' x 60'; Jno. Baldt & Son.
Brown St., w of Thirty-ninth St., 22 three-st'y dwells., 16' x 55'; T. L. Michaelson, contractor.

St. Louis.

Building Permits. — Seventy-one permits have been issued since our last report, fourteen of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —
R. W. Crittenden, one-st'y brick livery stable, cost, $4,987; P. W. Bassett, contractor.
Wm. Danwalter, two-st'y brick store; cost, $2,800; E. C. Janssen, architect; Phil Riechers, contractor.
Miss Maria Patterson, two-st'y brick laundry; cost, $6,000; D. Sullivan, contractor.
D. B. Brennan, two-st'y brick dwell.; cost, $2,700; T. W. Brady, architect; John Wesling, contractor.
Wm. F. Grace, two-st'y brick dwell.; cost, $2,550; T. W. Brady, architect; John Wesling; contractor.
J. Eberle, one-st'y boarding stable; cost, $3,000; F. Mueller, contractor.
Wm. Giester, two-st'y double brick dwell.; cost, $4,500; A. Beinke & Co., architects; J. Ratz, contractor.
Daniel Myers, two-st'y store and dwell.; cost, $2,800; Wm. Haekenhoff & Bro., contractors.
C. Riese, two-st'y double brick tenements; cost, $4,400; H. W. Rocklage, contractor.
W. D. Graut, two-st'y double brick dwell.; cost, $3,000; J. H. McNamara, architect; W. D. Barter, contractor.
M. Grunds, two-st'y double brick tenement; cost, $2,500.
B. Biermann, two-st'y double brick store and rooms above; cost, $5,000; B. J. Gosse, architect; Gosse & Remmers, contractors.
John Davis, 2 adjacent two-st'y double brick tenements; cost, $1,500; Herman & Schumacher, contractors.
Wm. M. Harton, 2 two-st'y double brick dwells.; cost, $12,000; J. Flannery & Bro., contractors.
Louis Marko, 5 adjacent two-st'y brick tenements; cost, $6,000; O. Koenig, architect; D. Fangman, contractor.
Dr. C. S. Carriere, two-st'y double brick dwell.; cost, $5,000; H. Dries, contractor.
A. Rombach, two-st'y double brick dwell.; cost, $5,500; E. C. Janssen, architect; W. C. Popp, contractor.
P. Herney, two-st'y double brick tenement; cost, $3,000; sub-let.
Wm. Maxwell, two-st'y brick dwell.; cost; $2,500; B. J. Gosse, architect; W. Paul, contractor.
P. Reagan, two-st'y brick dwell.; cost, $2,500; John Castello, contractor.
M. J. Sarazin, two-st'y double brick dwell.; cost, $2,500; T. H. Terrence, architect; F. H. Goss, contractor.
Mrs. J. Nast, two-st'y brick dwell.; cost, $3,000; Jacob Ratz, contractor.
Mrs. Rosemeyer, two-st'y double brick tenement; cost, $2,800; V. Beckerle, contractor.
Fred Auer, two-st'y double brick dwells.; cost, $4,000; G. Boettinger, contractor.

St. Paul, Minn.

Building Permits. — Two-st'y brick addition to school-house, e s of Western Ave., bet. Bantil and Goodhue Sts.; cost, $9,103; owner, Board of Education.
Two-st'y frame double dwell., s s of Twelfth St., bet. Pine and Broadway Sts.; cost, $11,500; owner, C. H. Iltner.
Three-st'y brick dwell., n s of Sixth St., bet. Exchange and Market Sts.; cost, $6,000; owner, J. F. Will.
Two-st'y frame dwell., w s of De Sota St., bet. Collins and Hopkins Sts.; cost, $2,535; owner, Wm. M. Becker.
Two-st'y frame dwell., s s of Chicago Ave., bet. Hyde St. and Dakota Ave.; cost, $2,000; owner, J. B. Farwell.
Four-st'y brick business block, n s of Fifth St., bet. Minnesota and Cedar Sts.; cost, $13,000; owner, E. F. Berrieford.
Two-st'y frame double dwell., w s of Broadway, bet. Fourteenth and Fifteenth Sts.; cost, $5,000; owner, Wm. Troy.
Two-st'y brick block, stores and dwells., n s of Seventh St., bet. Kittson and Neill Sts.; cost, $7,000; owner, Mrs. Braden.
Three-st'y brick block stores and dwell., n s of West Seventh St., bet. Walnut and Sherman Sts.; cost, $11,000; owner, Wm. G. Robertson.
Two-st'y brick veneer store and dwell., w s of Oakland Ave., bet. Annapolis and Wyoming Sts.; cost, $2,000; owner, Lizzie M. Vandervoort.
Two-st'y frame store and dwell., e s of Burr St., bet. Janks and Case Sts.; cost, $2,490; owner, Geo. F. Woolsey.
Addition to stone brewery, s s of Ohio St., bet. Isabel and Bellows St.; cost, $2,000; owner, A. Yoero.
Two-st'y frame dwell., s s of Marion St., bet. Wilder and Moore Sts.; cost, $4,000; owner, A. S. Martin.
Three-st'y frame vinegar factory, w s of State St., bet. Wright St. and the Creek; cost, $4,000; owner, Paul Martin.
Two-st'y brick barn, n s of West Fifth St., bet. Wabasha and St. Peter Sts.; cost, $4,235; owner, Mrs. Sarah Hall.
One-st'y brick purifying house, n s of East Fourth St., bet. John and Olive Sts.; cost, $3,500; owner, Add. J. Atkinson.
Two-st'y brick dwell., e s of Mississippi St., bet. Nash and Somerset St.; cost, $2,300; owner, John E. O'Brien.



Heliotype Printing Co., Boston.

THE DINING-HALL, HARVARD MEMORIAL HALL, CAMBRIDGE, MASS.

Messrs. WARE & VAN BRUNT, Architects.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS.

IT is nearly twenty years since the project for building an arcade railroad under Broadway began to be discussed in New York; and sixteen years ago, at least, the plan was so far matured that sectional drawings were generally circulated, showing the cellars of the great retail stores which line the street converted into salesrooms, and thronged with customers out of the crowd which occupied the subterranean sidewalks, while trains of cars passed and repassed between. The scheme was an attractive one to the New Yorkers of those days, but circumstances interfered with carrying it out, and the elevated railroads came, and for a time appeared to satisfy the desire of the citizens for rapid transportation. A year or two ago, however, the project, which had never lost all its vitality, was revived, and an effort was made to secure a charter for a company to carry out the original plan. Fortunately, perhaps, for all concerned, the attempt failed, and it was not until the privileges of the company were restricted to the occupation of the bed of the street from curb to curb, instead of from building-line to building-line, that its application was so far favorably received that it is likely to be granted. With this modification, there seems to be little or nothing objectionable about the plan, and the convenience and comfort of myriads of people will be greatly promoted, without injuring any one. It is disgraceful, but true, that the columns of some of the New York daily papers are so freely used in the interest of speculators that very little credit is to be given to the statements of facts which they make, and still less to the opinions which they express, about such matters; but, although the promoters of the arcade road have been abundantly maligned in some of the public prints, no objections have been urged against the present scheme itself, so far as we have seen, which merited serious consideration. About thirty property-owners on Broadway have, it seems, so far appropriated rights which belonged to the public as to extend the basements of their buildings beyond the curb, under the pavement of the street, and these will have their underground room somewhat curtailed, but vaults extending only to the curb will not be interfered with, and it is needless to say that such pipes or sewers as may come in the way can be easily disposed of. Costly as the undertaking will be, there can be no doubt that the capital invested in it will earn a handsome return. Nearly everything in New York centres in Broadway, through which lies what seems to most people the shortest route from every part of the city to every other; and either subterranean or aerial transit is likely, so far as it can, to prefer the same line. Hitherto, the very immensity of the traffic through the street has prevented even the consideration of plans for giving the traffic better channels, through the fear that it would be temporarily impeded; but if the engineers of the arcade road fulfil their promises, they will be able, without interfering appreciably with the present use of the street, to complete in four years an entirely new street below the old one, fitted with the necessary appliances for transporting a far greater number of passengers and bulk of freight than has ever yet passed over the surface street within a given time.

A CASE of considerable importance to builders has been brought before the Supreme Court of Massachusetts by Amaziah Mayo, Jr., of Springfield, who seeks the aid of the law in compelling the County Commissioners, who have awarded a contract for building a jail for the county to Messrs. Creesy & Noyes of Boston, to reverse their action, and give the contract to him, on the ground that he was the lowest bidder for the work, and is entitled to it. The plaintiff's petition is signed by eighteen or twenty other persons, who claim an interest in the case, as taxpayers, robbed of their just right to have their jail built by the lowest bidder, and the petitioners aver "that said Committee," this meaning, we suppose, the County Commissioners, "were bound to award said contract to the lowest responsible bidder, or reject all proposals and advertise for new." The petitioners further aver that Mr. Mayo is a responsible party, and claim that the Commissioners "had no right in law or equity to award said contract to any other" person. It is impossible, without knowing the words of the invitation to contractors to submit bids, to say just what rights the parties would probably be held by the court to have in the premises, but if, as is likely, a simple invitation was issued, without any promise to award the contract to the lowest bidder, it is probable that the Massachusetts court will hold, as so many others have before it, that, in the absence of any express statute limiting the discretion of the Commissioners in such matters, the latter were at liberty to select the contractor for the building according to their best judgment, in consideration of all the circumstances, of which the relative amount of the bids for the work is only one. This doctrine, as we know, is violently opposed by many builders, who claim that a comparison of the bids should be the only guide in awarding contracts, but common-sense, in our opinion, is decidedly against this claim, and the law, as has been well said, is only concentrated common-sense.

THE *Scientific American* gives an account of a new application of a form of lighting which is fast becoming common on the other side of the ocean. By this method, which is in use in a manufactory at Essen in Prussia, water-gas, free from admixture with hydro-carbons, is carried through the same pipes and burners originally put in for ordinary illuminating gas, but over each burner is suspended a "comb" composed of thin bars of calcined magnesia, somewhat smaller than the graphite bar in a lead-pencil, set in a small frame. The flame of the gas plays upon one of the magnesia bars, and heats it to intense whiteness, giving a steady, clear light, similar to that derived from the carbon filament in electric lighting by incandescence. This is by no means the first instance in which magnesia has been used for the same purpose, and in much the same way, but in all the earlier systems, so far as we know, the magnesia has been employed in larger masses, and in order to raise it to the proper temperature it has been necessary to intensify the heat of the gas flame by heating the current of gas before its arrival at the burner, either by causing it to circulate through passages formed in a small block of fire-clay exposed to the flame, or in some other way. When so treated, ordinary gas, or rather, gas mixed with atmospheric air, gives an intensely hot flame, and a piece of magnesia or other refractory substance can easily be brought to high incandescence in it; but the burners necessary for the purpose are complicated and expensive, and a cheap device for using the simple ordinary burners in the same way is likely to be very useful. In the Essen factory it is thought that pure water-gas, unmixed with hydro-carbon, is alone suitable for igniting the magnesia comb, but it is not very evident why ordinary gas, mixed with air in such a way as to secure perfect combustion, should not answer the same purpose. The magnesia bars are made by mixing finely-ground magnesia with gum-water or some similar material, moulding the little rods, and baking them at a high heat in a crucible. The comb is shifted over the flame, as the rods crumble away. Each comb contains rods enough to last from eighty to one hundred hours, and costs five cents, and with water-gas at something less than seven cents a thousand cubic feet, which is said to be the

cost of the water-gas at the Essen establishment, the total expense of the light is very small.

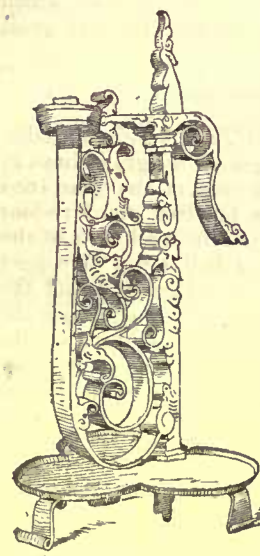
THE editor of the *Builder*, in an article about the architectural portion of the exhibits at the Paris *Salon*, introduces his subject by some suggestive remarks upon architectural exhibitions in general. As he truly says, the *Salon* rooms devoted to architecture are always deserted, except by a few stragglers, while the neighboring rooms, filled with pictures and sculpture, are crowded day after day by eager amateurs, many of whom take long journeys every year for the sole purpose of seeing the objects collected there; and yet architects claim that the art which they profess is the greatest of all, notwithstanding the indifference with which its representations are regarded by the public. In the opinion of the editor of the *Builder*, the architects are right in their estimate of the dignity of their own art, and one cause, at least, of the neglect with which it is treated by others lies in the depraved taste of the "loungers," who prefer to look at the pictures "whose superficial and sensational merit fills them with idle admiration." With all possible respect for the judgment of this admirable writer on all artistic subjects, we cannot quite subscribe to his conclusions. It has often been observed that when any art comes to depend for appreciation upon the trained taste of a select few, that art has entered upon its decline; and however we may despise the "loungers" in the next room, and the "superficial admiration" which they bestow upon other works than our own, we cannot afford to overlook the evidence which this fact gives that our own art, or, at least, the way in which we practise it, appeals very feebly to the imagination or intelligence of our fellow citizens; which is equivalent to saying that the art of architecture, notwithstanding the merit of its professors, is at present, as compared with sculpture or painting, in a state of very limited vitality.

SO far as exhibitions are concerned, the architects, as compared with their rival artists, are, at present, under a special and serious disadvantage, by reason of the bald and disagreeable style in which it is the fashion for them to display their works. To the world in general a building is a building, and is best shown by representations which give as nearly as possible the exact look of the structure, but in architectural exhibitions, particularly in France, buildings, as such, are ignored, and in their place we have geometrical drawings, which are almost always necessarily false and distorted in effect, so technical as to be untranslatable except by experts, and rendered with a gloomy and muddy compound of Indian ink and burnt sienna washes which places them at a great disadvantage in comparison with the pictures in the rooms near by, radiant with the charm of full and beautiful color. Aside from this, however, it cannot be denied that modern architecture, even if shown by photographs or pen-and-ink sketches, which are far more generally liked than washed drawings, is not interesting to persons outside the profession. Whether they ought to care for it or not, the fact remains that they do not, and until they do, it will be difficult to prevent those who practise sculpture and painting from treating our pretensions to rivalry with them in a way which we do not like. It is of no use to plead that the art of architecture deals with forms so conventionalized as to require the highest effort of the imagination to grasp and keep in the conventionalization the sentiment intended to be enforced, to the exclusion of all others. True as that is, it does not follow that because our art demands great mental power, a similar power is requisite for appreciating its works. On the contrary, the highest quality which any work of art can display, aside from the idea which it is intended to express, is a simplicity and force in conveying that idea which makes it impossible for any one to mistake or escape it; and as all the forms by which the architectural art can convey impressions are already familiar to every one, we have, as it seems to us, little reason to complain of anybody except ourselves if our attempts to use those forms as elements of artistic effect meet with a doubtful response. One of these days, when the master shall appear among us who can compose in wall-surface and shadow, in outline, and sculptured decoration and enrichments of color, with some such inspiration as that which enabled Handel to combine a few familiar elements into music which lifts our souls to heaven, we shall find that the public can appreciate this sort of architecture as well as we, and, wondering that nobody ever thought of doing that before, we shall set ourselves to follow in the new road, which will lead us, we may venture to hope, toward the next great epoch of architectural art.

LA SEMAINE DES CONSTRUCTEURS gives a table compiled by M. Barré, of the length of telegraph lines in all the countries of the world. At the end of the year 1884 there were, according to this table, five hundred and fifty-four thousand miles of telegraph lines in operation in all parts of the earth, employing about a million and a half miles of copper wire. About five-sixths of the lines are terrestrial, and the land lines employ, on an average, twice as many wires for the same distance as the cable lines, so that about eleven-twelfths of the telegraph communication of the world goes on over dry land. Naturally enough, the United States possesses a greater length of telegraph lines than any other country, the total being nearly one hundred and thirty-nine thousand miles, each line averaging three wires. Russia comes next, with only sixty thousand miles of line, and twice that length of wire; and France and its colonies follow close after. Great Britain, with its colonies, would probably rival Russia in length of lines, but the statistics for Canada are not given in the table. Switzerland, in proportion to its size, is remarkably well furnished with telegraphs, having four thousand miles of lines, averaging four wires each. Curiously enough, both these figures apply almost exactly to the telegraph system of New Zealand, which most of us have probably supposed to be practically a savage country. Belgium has about the same length of lines as Switzerland, but nearly twice as many wires; and Italy is enterprising enough to have established sixteen thousand miles of line, with nearly fifty thousand miles of wire.

MOST of our readers have probably heard of the baby-brooder, to translate the French name of an apparatus imitated from the incubator so commonly used for hatching eggs; but every one may not know that the infant-incubator, so far from being a scientific toy, is now coming rapidly into use in the French maternity hospitals, and is even regularly made by the manufacturers of medical and surgical appliances, and sold to customers in all parts of France. According to Dr. Hector George, who gives in *Le Génie Civil* an account of the more recent experiments made with the apparatus, the original example, which was first exhibited with the chicken-hatcher at the agricultural fair in Paris in 1880, has been in use since that time at the Maternity Hospital in Paris, with singularly good results. The construction is very simple, the whole affair consisting simply of a double box, placed on a stand. Two panes of glass form the top of the upper box, in which is placed the baby, in its cradle; and in the lower box is placed a vessel of hot water. There are openings between the upper and lower box, and also in the bottom of the lower box and the top of the upper one. Air from the room enters by the lower opening, and is warmed by contact with the hot-water reservoir, and rises to the upper box, from which it escapes through the openings in the top. The child is thus constantly bathed in a warm, fresh, moist atmosphere, which is kept at a temperature of eighty-six to ninety degrees Fahrenheit, as shown by a thermometer hung in the upper box, by adding hot water to that in the reservoir. Every two hours the child is taken out to be nursed and changed, and is then replaced in its box. The influence of the still, moist, warm atmosphere on feeble infants seems to be very favorable, and the apparatus is devoted, in the hospitals, to encouraging the development of puny or prematurely-born children. The average weight of healthy children, born at the usual time, is said to be nine-and-one-half pounds. Those that weigh less than five pounds at birth are classed by themselves as feeble, and unlikely to live, the mortality in this class in maternity hospitals being generally sixty-five or sixty-six per cent. With the help of the baby-incubator this percentage appears to be reversed, sixty-two out of ninety-three prematurely-born children brought up in it having passed the critical period in safety. The disease known as the œdema of the newly-born, which usually carries off four-fifths of those afflicted with it, is also treated in the incubator with singular success, twenty-one out of twenty-five infant patients kept in this warm atmosphere having passed through the disease safely.

ARCHITECTURAL TERRA-COTTA.—I.



Wro't Iron Candlestick, 17th Cen.—So. Kensington Museum.—

BROADLY speaking, the term terra-cotta can be applied to all forms of baked clay, whether it be used for the manufacture of domestic utensils, such as jugs, crocks, etc., or for sewer-pipes, or other forms for which burned clay is utilized; drain tiles and pipes are, perhaps, as potent agents of civilization as the most beautiful productions of the potter's art; but the object of the present article, however, is to treat of the architectural employments of terra-cotta.

The use of this material for architectural purposes dates prior to the times to which our histories reach. In the mythical history of Greek art, we find that Debutades, Rhœcus, Theodos, and others, are mentioned as masters in works of clay. Homer also refers to them, and if we accept the evidence of Dr. Schliemann, the terra-cotta ornaments found upon the hill of Hissarlik must have formed some part of the pottery collection of King Priam. The Assyrians used terra-cotta cylinders or tablets for all the purposes for which the Egyptians employed papyrus, and for which we now use paper, cards and books. These tablets are inscribed with the records of events; bulletins recording the King's victories and the annals of his reign were published on terra-cotta cylinders having the appearance of a rolling-pin, and these were usually hollow, or hollow hexagonal prisms. The inscriptions were placed in different forms, those on the cylinders being engraved lengthwise, while in the prisms they are in compartments on each face. Both forms were made of a very fine material, sometimes unpolished or unglazed, and at other times covered with a vitreous silicious glaze, or white coating. Title-deeds, evidencing the sales of land, were inscribed on rectangular pieces of polished terra-cotta slightly convex on each side, and, as fraud was just as common in those days as now, a cylinder was run around the edges, or across the deed, in order to prevent any enlargement of the document; this cylinder left its impression in relief; if names of witnesses were affixed, each one impressed his oval seal on the wet terra-cotta, which was then carefully baked in the kiln. Records of the sales of Phœnician slaves were also made upon these tablets, the name of the slave being inscribed in Phœnician on the edge. In the palace of Sennacherib at Kouyunjik, there were found collections of almanacs, deeds, histories and spelling-books. It is doubtful with what nation the art of modelling figures in clay originated; the Corinthians have been awarded precedence, although both the Greeks and Romans claim prior title to the invention; but as most of the figures have been destroyed by the barbaric races, their origin cannot be easily followed, and their history will probably long remain more or less hypothetical. The life-size terra-cotta figure of Mercury in the Museum of the Vatican and also some of the large terra-cotta statues in the Museum of Naples, are probably Grecian. The famous torso in the British Museum is also a fine specimen of early modelling in terra-cotta. The ancient statues with which the Roman temples were adorned were made of terra-cotta, but the general opinion is that many of them were purchased from the Greeks and Etruscans.

The employment of terra-cotta in architectural decoration is the most interesting branch of Roman ceramic art, and "until Rome became possessed of the quarries of Luna, marble was excessively scarce, and terra-cotta was employed for the antefixæ or bas-reliefs which formed the interior decoration of a house, the metopes and historic friezes."

In the present article we have not the space nor is there any need that we should enlarge upon the merits of plastic sculpture. "The unrivalled collection of the Louvre shows more eloquently than any description to what perfection this branch of the art had attained, both among the Greeks trading with Rome and among the Hellenes settled in Italy. We learn by a letter from Cicero to Atticus that a number of these bas-reliefs came from Athens, and the great orator asks his friend to procure models with which he desires to decorate his atrium. Therefore, though the greater number of the works classed in the Louvre came from Tusculum, or Roma Vecchia, localities of the Campagna di Roma, magnificent villas, we do not seek to distinguish those evidently Greek from their imitations."

The Greeks undoubtedly made the greatest development in modelling in statues and bas-reliefs; but they probably relinquished the production of large works in terra-cotta when they acquired the arts of working in marble and bronze. After the fall of the Roman Empire, and in sympathy with the decline of all other arts, terra-cotta manufacture for artistic employments rapidly degenerated; but in Italy, during the fifteenth and sixteenth centuries, the capabilities of terra-cotta were more fully appreciated than at any time before or since that period, and exquisite examples are offered in the enamelled bas-reliefs by Luca della Robbia, and the details of many churches in northern Italy. The modern employments of terra-cotta promise, however, to exceed even those of former ages, and its revived use is in accordance with the progress of the times, which demands honest construction and artistic decoration in lieu of the sham and immature productions of the period just past. With the accumulation of wealth and consequent leisure, the love of building, which man shares with the ant and the beaver, has developed into a love of proportion, of harmony, and of beauty. The fierce conflagrations, with their attendant trains of misery and loss, to which some of the great cities of this country have been subjected, still excite horror at the past calamities and apprehension for future ones, and indelibly impress upon us the absolute demand for the employment of fire-resisting substances in architectural construction. Terra-cotta has proved itself, through many centuries of use, to be absolutely fire-proof, and there is not the slightest room for doubt but that we are now on the threshold of an era in which this material will be employed in untold manners and forms. Shoddy textures and materials are now vanishing with the immaturity with which they were generated, and the time of the cheap and the unstable in constructive material, as well as in constructive decoration, is rapidly vanishing before the present spirit of progress.

The quarter of a century just past has witnessed many changes in our country; America's development in mechanics and the arts has been phenomenal; but with all her progress, there is no branch to which we can look with more satisfaction than to the evidences of art which many of the public and private buildings in our large cities present. Among the first buildings in which terra-cotta was used in this country were the Cooper Institute Building, in New York City, and the State-House in Springfield, Illinois, no further effort being made to bring it into use, until it was resorted to for ornamentation in the construction of the Museum of Fine Arts in Boston, and then it was imported from England. The material has been employed, for the first time in the United States, both for the building material and for all decorative details, in the recently-erected building for the Long Island Historical Society in Brooklyn, and with the most satisfactory results. The new Metropolitan Opera-House in New York City presents some very beautiful samples of terra-cotta work, the panels of the façade being especially worthy of note. Among other prominent buildings in New York City, which have been erected during the past few years, in the construction of which terra-cotta has been largely used, are the new Jefferson Market, the Williamsburg Fire Insurance Company's Building, the Mutual Life Insurance Company's new Building, the *Post* Building, Fulton Market, Washington Market, and many other equally well-known structures.

In Chicago this material has been very liberally used in some of the finest residences recently constructed on Michigan Avenue. The first building in which terra-cotta was used in Chicago is the Portland Block, and some very fine terra-cotta work can be seen in the Montauk Block, the Calumet Building, the Open Board of Trade Building, and the Pullman Palace-Car Building.

The Pennsylvania Railroad Station on Broad Street in Philadelphia, presents, in its decoration, numerous examples of the artistic employment of terra-cotta for constructive purposes.

The Pension Building at Washington, D. C., is an immense structure, girting nearly one-fourth of a mile, and above the windows of the first story and extending entirely around the building, there is a beautiful frieze of terra-cotta depicting incidents of the late civil war, and in this frieze there are shown infantry, artillery, and wagon-trains, as in motion; other portions of the structure are ornamented with terra-cotta appropriately employed. But its greatest use as an architectural decorative material, however, is its employment in the building for the Produce Exchange of New York City.

In England and on the Continent terra-cotta is also very largely used in architectural constructions, and even far-off India presents numerous buildings in which this material has been employed of late years for decorative purposes. The terra-cotta used in India, as also that employed for many of the buildings in her Australasian colonies, is manufactured in Great Britain.

The difference in the clay used for terra-cotta and that employed for making bricks is one of degree only. Clay is one of the results of the disintegration and attrition of various primary rocks, and chiefly consists of alumina in combination with silica and certain salts and water. The fusibility of clay depends largely upon its mixture with alkaline salts and alkaline earths, which act as fluxes, and the terra-cotta clays are those which are comparatively free from such admixtures and contain a large proportion of alumina.

The best clay used in the manufacture of architectural terra-cotta is found in Middlesex County, New Jersey. Ninety per cent of the whole product of clay used in the United States for this rapidly-increasing business is taken from the clay beds in this county, and sixty per cent of the manufactured product is furnished by the two firms founded by Alfred Hall, at Perth Amboy, twenty-five per cent being produced in Boston, and fifteen per cent in Baltimore and Chicago.

The Baltimore firm uses clay found in Maryland, while that used by the Chicago manufacturers is derived partly from that city and its suburbs, such clay being employed for making copings and common chimney-pots. The better qualities of clay used for architectural terra-cotta in Chicago comes from southern Illinois and Indiana, while for very fine work both the Baltimore and Chicago manufacturers of terra-cotta, as well as those of Boston, derive their clay from New Jersey.

The clay-beds of New Jersey are practically inexhaustible, and as these immense clay-fields, contiguous to the seaboard and connected

by railroads with all portions of this country, are the most important and characteristic of all that lie within our States, so the architectural decorations which have been modelled from their plastic substance, as well as the beautiful buildings which they adorn, are the most magnificent of modern construction. For a long distance between Woodbridge or Perth Amboy and New Brunswick there are numerous excavations in these clay-fields, which not infrequently extend for more than one hundred feet in depth, and at the bottom of these clay-pits winding roads lead around banks of clay, where numerous gangs of men are constantly at work mining the clay, which is separated into various grades either for use in the State or for shipment to other portions of the country. The very fine clays are sent to New York City and other places for use in the manufacture of wall-papers, while other grades of clay are intended for shipment to Chelsea, Mass., to be utilized in the manufacture of decorative tiles, and still other varieties of clay are to be used at Woodbridge and Perth Amboy for the manufacture of fire-bricks, and the commoner clays for the manufacture of building bricks, while the terra-cotta clays are separated into different grades. Those containing a large percentage of oxide of iron are utilized for the manufacture of red-colored terra-cotta, and the clays containing only traces of iron are intended for the production of light or buff-colored terra-cotta.

TALL CHIMNEY CONSTRUCTION.[1] — I.



Military Courage. — Tomb of Gen'l Lamoricière. — France. Paul Dubois. Sculptor.

As a return for some slight assistance we were able to give them in their investigations, the Messrs. Bancroft have sent us for re-publication the valuable paper on Chimney Construction which they last year read before the Civil and Mechanical Engineers' Society of London. We propose to re-publish it entire, and in that way secure for our readers a permanent record of their investigations: —

It is of very great importance that the best materials and workmanship should be used in the construction of chimney-stacks, and that they should stand independent of all surrounding buildings, both on account of their greater weight, and on account of there being always a swaying motion in a gale of wind. It is also desirable that they should be built in the summer time, and the foundations should have time to settle before erecting the shaft, for great pressure will prevent the setting of any concrete that may be used in the foundations. It is imperative that these rules should be observed, so as to ensure stability, and render less liable the failures and fatal occurrences that are so often recorded in our professional papers. Several instances will be mentioned during the progress of my paper, and I may state that Mr. Edwin Nash, in his paper on "Failures in Construction," mentions that in 1849, soon after being erected, the chimney at the Counterslip Sugar Works, Bristol, fell, and several years ago there was another case at Joynson's Paper-Works, St. Mary Cray, and at many other places, and generally from careless design or bad workmanship, both of which are quite inadmissible in tall structures.

I find upon reference to the various authorities who have written about chimney construction, that there is a wide difference of opinion as to the proper dimensions they should have.

Mr. Robert Armstrong, in the appendix to his "*Chimneys, Furnaces, and Fireplaces,*" published by Spon (1866), page 63, says: "It may be set down as an axiom that a *steam-engine chimney cannot be too large,* if only provided with a damper, although ninety-nine in one hundred at the present time (1866) are decidedly too small. They are unable to create a sufficient draught of air through the furnace, consequently a *smoky flame* is produced, instead of a flame with little or no smoke."

Against Mr. Armstrong's opinion we learn from Mr. Peter Carmichael, in his paper on "Factory Chimneys," read before the Institution of Engineers in Scotland, 1865, that his "experience is that most factory chimneys are too large for the work they have to do; not too high (they can hardly be that), but too wide, especially at the top. In our practice (Messrs. Baxter Brothers' flax mills, Dundee), invariably as more boilers and furnaces have been added to a chimney the draught has been improved; and it is obvious, that if the opening in the chimney be too large compared with the whole of the openings in the dampers passing into it, the draught will be reduced. Hence it is very noticeable in many chimneys, which are too large in proportion to the number of furnaces they serve or the coals consumed, or when a new chimney is put up to serve for prospective additional furnaces, that the smoke issuing from such has a very lazy ascent, and they are generally blackened a long way down from the top by the smoke, for when a breeze is blowing the smoke, instead of ascending, falls down the leeward side of the chimney, and clings to it like a ragged black flag."

Mr. Robert Wilson, in his "*Boiler and Factory Chimneys,*" published by Crosby, Lockwood & Co., 1877, cautions us against too large a flue; he says: "It is usually considered that the larger the area of the chimney the better the draught, but this is not always the case with lofty chimneys where the gases can *cool down too rapidly* in a chimney of large section, and it has been found in several instances that when chimneys are very large for the number of boilers they serve, or for the quantity of coals burnt, as when a chimney is built to serve for future additions to the boiler power, the draught is improved by the better maintenance of temperature as additional boilers are set to work [thus agreeing almost word for word with Mr. Peter Carmichael]. When the area of the chimney is much larger than the aggregate area of the flues debouching upon it, the diminution of friction and the expansion of the hot gases into a large area, are favorable for the improvement of the draught. But the velocity of the ascent of the heated gases may be very much diminished, and in extreme cases, where the ascending current does not fill the chimney, so to speak, downward currents of air will be produced, especially with the wind in certain directions, to the impairment of the draught."

TEMPERATURE OF ESCAPING GASES.

Mr. Peter Carmichael recorded observations made from time to time for several years on the temperature of the escaping products of combustion in the flues, and at the bottom of the chimneys, and also took notes of the force of the draught, both of which are important elements in considering the value of a chimney for doing its work properly, and he gives the results as follows: —

The temperature is obtained by using small strips of the following metals: zinc, which melts at 700°; lead, 600°; bismuth, 500°; and tin, 440°. Small bits of each of these, about one inch long and one-half inch broad, are pierced with a hole for passing a wire through, and suspended in the flues behind the damper, or at the bottom of the chimney, and the time noted when they are melted. From these observations, frequently repeated and tried under various circumstances, it has been found that the temperature is nearly uniform at 600° behind the dampers; 440° melts at once, 500° generally in less than a minute; 600° melts when the fires are in good condition; and 700° does not melt. So unvarying are these results under different circumstances, that I assume 600° at the bottom of our chimneys as a standard of temperature of escaping products.

FOUNDATIONS.

The foundation of a structure bearing a great weight upon a small surface must be carefully attended to. If a good, natural bottom is not to be obtained, an artificial foundation must be made, either by concreting or driving piles; the former is generally sufficient. At the spot upon which the structure is to be raised, the different strata immediately beneath the surface must be examined by boring until some definite stratum be reached; by a reference to the depth of this bed some idea of the extent of excavation is arrived at. In all cases the foundation must be equally resistant; that is, all parts of it must be capable of bearing the same amount of pressure; if this be not attended to, unequal settlement is sure to result. In all cases the "made earth" must be removed. If the stratum immediately beneath be of clay, gravel, chalk, or other firm bed, and found to be sufficiently thick for a solid bearing, the excavation may be finished and the foundation laid in. In the neighborhood of London, the sub-stratum is generally "made" earth, beneath which, at variable depths, not often exceeding twelve feet, a good bottom is usually met with, when, to save brickwork, concrete may be thrown in until only enough depth is left from the surface to cover the footings of the chimney.

The building for the Albion Mills was erected upon a very soft soil, consisting of the "made ground" at the abutment of Blackfriars Bridge. To avoid the danger of settlement in the walls, or the necessity of going to a very unusual depth with the foundation, Mr. Rennie adopted the plan of forming inverted arches upon the ground, over the whole space upon which the building was to stand, and for the bottom of the dock. For this purpose the ground upon which all the several walls were to be erected was rendered as solid as is usual for building, by driving piles where necessary, and then several courses of large, flat stones were laid to form the foundations of the several walls; but to prevent any chance of these foundations being pressed down, in case of the soft earth yielding to the incumbent weight, strong inverted arches were built upon the ground between the foundation courses of all the walls, so as to cover the whole surface included between the walls; and the abutments or springings of the inverted arches being built solid into the lower courses of the foundations, they could not sink unless all the ground beneath the arches had yielded to compression, as well as the ground immediately beneath the foundation of the walls. By this method the foundations of all the walls were joined together so as to form one immense base, which would have been very capable of bearing the required weight, even if the ground had been of the consistence of mud; for the whole building would have floated upon it as a ship floats in water; and whatever sinking might have taken place would have affected the whole building equally, so as to have avoided any partial

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[1] A paper by R. M. Bancroft and F. J. Bancroft, read before the Civil and Mechanical Engineers' Society.

depression or derangement of the walls; but the ground being made tolerably hard, in addition to this expedient of augmenting the bases by inverted arches, the building stands quite firm.

Mr. Edwin Nash, F. R. I. B. A., says it is possible to build well upon a uniform bed of peat by carefully spreading the weight over the whole surface, and many structures have been so built. Most of the houses in the neighborhood of Finsbury Square and Finsbury Circus stand upon a somewhat peaty bed, and the site of the London Literary Institution had a bed of that sort. If the whole of that building had been founded upon the undisturbed surface of the peat, instead of cutting through it for the main external walls only, as was done, there would probably have been few or perhaps none of those irregular settlements which were occasioned by some subsidence of the internal walls, from the drying up of the peat a long time after the building had been erected, and which rendered underpinning necessary.

A good example of the value of concrete is afforded by a chimney that was built by Mr. Clegg, at Fulham, in 1829. The foundation was a quicksand. After the excavation was got out to the depth of fifteen feet, an iron rod sank, with little more than its own weight, fifteen feet more; it was, in fact, Mr. Clegg says, as bad a foundation as could possibly occur.

The pressure on foundation of the Edinburgh Gas Works Chimney is eight and one-half tons per square foot.

The piers of Charing Cross Railway bridge, resting on the London clay, bear a weight of six tons per square foot superficial, and show no sign of settlement.

TOWNSEND CHIMNEY, PORT DUNDAS.

The highest church spire in Europe is that of St. Nicholas, Hamburg, four hundred and seventy-two feet; that of Strasburg four hundred and sixty-six feet from ground surface. Both these heights exceed that of the "Townsend Chimney," Port Dundas, Glasgow; its total height from foundation to top of coping being four hundred and sixty-eight feet, and from ground level to summit four hundred and fifty-four feet. The history of its construction, and of its threatened failure when nearly completed, will therefore be of great interest to all who have made chimney-shafts or stalks their study, and, indeed, to architects and engineers in general. The chimney was designed and built by Mr. Robert Corbett, Bellfield Terrace, Duke Street, Glasgow, for Mr. Joseph Townsend, Crawford-street Chemical Works, Port Dundas.

No piles were used in the foundation, which is built on "blue till," or clay, which is as solid and compact as rock. The foundation consists of thirty courses of bricks on edge, the lowest course being fifty feet, and the topmost course thirty-two feet diameter. This foundation was commenced on July 30, 1857, and finished on August 20 of the same year.

The erection of the shaft was continued until November 11, 1857, (excepting from September 3 to October 5, during which period operations were suspended). This closed the first season. The second season commenced on June 10, 1858, and closed on October 16 in the same year, the stalk at the latter date being two hundred and twenty-eight feet in height. The third and last season commenced on June 3, 1859, and the coping was laid on October 6 of the same year; but the work was suspended from September 15 to October 5, in consequence of the chimney swaying. During this interval it was restored by twelve cuttings with saws on the opposite side of the inclination, as detailed hereafter.

The inside lining or cone is of nine-inch fire-brick, and about sixty feet in height, built distinct from the chimney proper, with air-space between, and covered on top, to prevent dust from falling in, but built with open work in the upper four courses, so as to allow of air passing into the chimney.

The size of the bricks used in the construction of this chimney was ten inches by four inches, by three and one-half inches, and the number consumed was as follows: —

Common bricks in chimney	1,142,532
Composition and fire-bricks in cone .	157,468
Total	1,300,000

The bricklayers' time was: —

In 1857, 316 days of 10 hours each,
In 1858, 431½ " " "
In 1859, 423½ " " "

giving a total of 1,171 days' time occupied in building the chimney, which gives on an average 1,110 bricks built per day of ten hours by each bricklayer.

Besides the above number of bricks used in the chimney, there were also 100,000 used in constructing flues, etc. The total number of bricks laid in chimney and flues was 1,400,000, the weight of which, at five tons per thousand, is 7,000 tons.

The cope is of vitrified till, purposely made about nine inches wide by three inches thick, flanged over wall of chimney, and jointed with Portland cement.

The top of the chimney was struck by lightning some time since, which displaced and threw to the ground some pieces of coping, and upon inspection only one of the flanges were found to be broken.

Iron hoops were built in at a distance from the surface of nine inches at the bottom, and four and one-half inches at the top, and at intervals of twenty-five feet in height.

The thickness of the wall of the chimney varies as follows, commencing, of course, at the ground level: —

Section	Height	Thickness
1st section,	30 feet in height,	5 feet 7 inches thick.
2d "	30 "	5 " 2 " "
3d "	30 "	4 " 10 " "
4th "	40 "	4 " 5 " "
5th "	40 "	4 " 0 " "
6th "	40 "	3 " 7 " "
7th "	40 "	3 " 2 " "
8th "	40 "	2 " 9 " "
9th "	40 "	2 " 4 " "
10th "	52 "	1 " 11 " "
11th "	52 "	1 " 7 " "
12th "	20 "	1 " 2 " "
Total.	454 feet from ground line.	

The height originally contemplated for the chimney was four hundred and fifty feet; but when about three hundred and fifty feet up it was proposed to add about thirty-five feet to the original height, making the total height four hundred and eighty-five feet; hence the increased height of the tenth and eleventh sections. But on the completion of the eleventh section this idea was abandoned, and therefore only twenty feet of the last thickness were added.

The building was not built by contract, but by day wages, as Mr. Townsend was not quite certain to what height he would carry it, or what deviation might be made in course of construction from the proposed plan. Three different dimensions were calculated by the builder; those carried out were the greatest of three. The builder calculates the cost of the chimney and cone (exclusive of iron hoops in chimney and flues) at from £5,500 to £6,000. Mr. Townsend estimates the cost of the whole, including flues, iron hoops, machinery and scaffolding at £8,000.

On September 9, 1859, the chimney was struck by a gale from the northeast, which caused it to sway; but the builder does not attribute the action to the gale alone, but to the pressure of the whole pile on the scaffolding, which was so constructed as not to yield to any pressure caused by a slight settling down. The additional pressure thrown by the wind to the lee-side of stalk (the mortar of which was not solidified) was consequently too great for the scaffolding to bear, and caused the splice of one of the uprights to give way by abrasion, making the fibres of the wood to work in each other. The ends of the planks forming the scaffolding were placed about five feet or six feet apart vertically, and were tightly built into the masonry; but had a little space been left over each, the stalk would have subsided uniformly, and would possibly have withstood the gale. The builder observed the error, but too late. He thinks the deflection commenced at from one hundred feet to one hundred and fifty feet from the ground, so that the foundation and heaviest portion remained firm. Had not the process of sawing been commenced promptly and continued vigorously, in all likelihood the chimney would have fallen. Even during the earlier part of the process of sawing, Mr. Townsend, who was on the ground the whole time, observed the deflection increasing, but as the sawing progressed he observed that the deflection got a check, and the chimney came-to gradually. The chimney was seven feet nine inches off the perpendicular, and seven feet less in height than before it swayed; but when brought back it gained its original height, at which time it was not completed by five feet.

Mr. Townsend made his observations during the sawing-back by taking a position in the room of the works near by the chimney where he had a full view of it, and fixing the ends of two pieces of twine to a beam above, he formed them into two plummet-lines in a line with the stalk, and with these alone he directed the adjustment of the colossal mass.

The sawing-back was performed by Mr. Townsend's own men, ten working in relays, four at a time sawing, and two pouring water on the saws. This work was done from the inside, on the original scaffolding, which of course had not been removed. Holes were first punched through the sides, to admit the saws, which were wrought alternately in each direction at the same joint. This was done at twelve different heights from the ground line, viz., 41 feet, 81 feet, 121 feet, 151 feet, 170 feet, 189 feet, 209 feet, 228 feet, 240 feet, 255 feet, 277 feet, and 326 feet. The men discovered when they were gaining by the saws being tightened with the superincumbent weight. It took six men continuously to do this work, at a cost of £400.

Prior to the sawing operations they had taken out and altered the bolts of the scaffolding, so as to relieve the pressure on it. This was done to meet the want of a little spare space over the ends of the uprights, as before stated.

PROTECTION FROM LIGHTNING.

In answer to inquiries I made, Mr. Townsend says; "Our stack is protected from lightning by two copper-wire conductors, half an inch thick, opposite each other all the way up, jointed to one pike fixed to the chimney, but standing above it, at the top. It was erected by a Steeple Jack, of Manchester, immediately after the chimney had been put straight, about 1859 or beginning of 1860. The chimney had been several times struck by lightning and slightly damaged. It is intended to put three more pikes at the top, and take the conductor round the chimney from pike to pike, to give a better opportunity for absorption of the electric fluid."

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

THE "DAKOTA" STABLE, NEW YORK CITY, MESSRS. CHARLES W. ROMEYN & CO., ARCHITECTS.

THIS structure forms part of a scheme started some years ago by the late Edward Clark, and since continued by the estate, for the improvement of the "West side," bordering on Central Park. The building is intended to afford stable accommodations for the many tenants of the estate and for the general public of the neighborhood who, until its completion, have been without such a convenience. The walls of the building are started on a base of dressed bluestone, Croton brick and terra-cotta being employed above to the line of cornice, which, together with the dormers, is of copper. A prominent feature in the plan is the entrance court, thirty feet by thirty feet in size, the walls of which are lined with imported enamelled brick. From this court ingress is obtained to the carriage floors. By an easy incline horses ascend to the second floor, which contains the stalls. The third floor is divided by a large hall at each end, and contains space for storage of feed and carriages. The construction is of the most substantial kind, and the ventilation is perfect. The total cost (including blasting for cellars, etc.,) was $70,000.

COMPETITIVE DESIGN FOR A STABLE, SUBMITTED BY "*Much in Little Space.*"

FOUNDATION to be of brick or stone piers under main walls and partitions. Construction to be of frame. Outside walls covered with sheathing boards. Plaster, rough-cast, in panels of first story, as shown, to be plastered on iron lath; sawed pine shingles on lower part. Roof to have rafters 2" x 8", covered with one-inch roofing boards and sawed pine shingles. First story to have interior walls and ceiling covered with seven-eighth-inch Georgia pine, which is simply oiled. No paint, except outside trimmings. Chimney built of stock brick, laid in red mortar. Loft is left unfinished in one large room; to have good spruce flooring.

NEW YORK, December 18, 1884.

I will build stable from plans and specifications for sum of $1,500.

P. B. MCENTYRE,
Builder.

A CLOCK-CASE DESIGNED BY MESSRS. RUSSELL & HUIDEKOPER, ARCHITECTS, WORCESTER, MASS.

THE sketch shows a case designed for an old clock which was bought at a sale of antiquities in Paris. The clock, whose mechanism was considerably wrecked at the time of its purchase, is now in working order. It has thirteen bells, twelve of which are for the chimes; these play at the hour and half-hour. The works were examined by several clock-makers in Paris, each of whom asserted that, judging from the workmanship and the kind of iron employed, it had been constructed in some monastery in the Netherlands in the sixteenth century. The dial is carved out of a single piece of black-walnut, and the color decoration on it is still in good preservation. The figures in relief representing the hours are black on a gilt background; the rest of the face is dark blue, adorned with gilt stars. The cherub heads are also colored, their wings being bright red. The two conventional-looking fish beneath the dial are black; their eyes and mouth are touched up with a little vermilion.

THE JERUSALEM CHURCH, BRUGES, BELGIUM.

THIS building, on the outskirts of the city, derives its name from the fact that beneath the choir is a model of the Holy Sepulchre, placed there by a burgomaster of the city, one Messire Anselm Adornes, who twice visited Jerusalem to insure the accuracy of his model. The building itself dates from the middle of the fifteenth century.

HOUSE FOR DR. H. A. SMITH, CINCINNATI, O. MR. S. E. DES JARDINS, ARCHITECT, CINCINNATI, O.

HOUSE FOR H. L. RICHMOND, ESQ., MEADSVILLE, PA. MR. W. S. FRASER, ARCHITECT, PITTSBURGH, PA.

OLD CHATEAU NEAR ANTWERP, BELGIUM.

THIS building contains a collection of antiquities of an archæological character.

SPECIFIC GRAVITY OF AMERICAN WOODS. — Of the four hundred and thirteen species of trees found in the United States, there are sixteen species whose perfectly dry wood will sink in water. The heaviest of these is the black iron-wood (*Condalia ferrea*) of Southern Florida, which is more than thirty per cent heavier than water. Of the others, the best known are the lignum vitæ (*Guaiacum sanctum*) and mangrove (*Rhizophora Mangle*). Another is a small oak (*Quercus grisea*), found in the mountains of Western Texas, Southern New Mexico and Arizona, and westward to the Colorado desert, at an elevation of five thousand to ten thousand feet. All the species in which the wood is heavier than water belong to semi-tropical Florida or the arid interior Pacific region.

ARCHITECTURE AT THE ROYAL ACADEMY. — I.

LONDON, May, 1885.



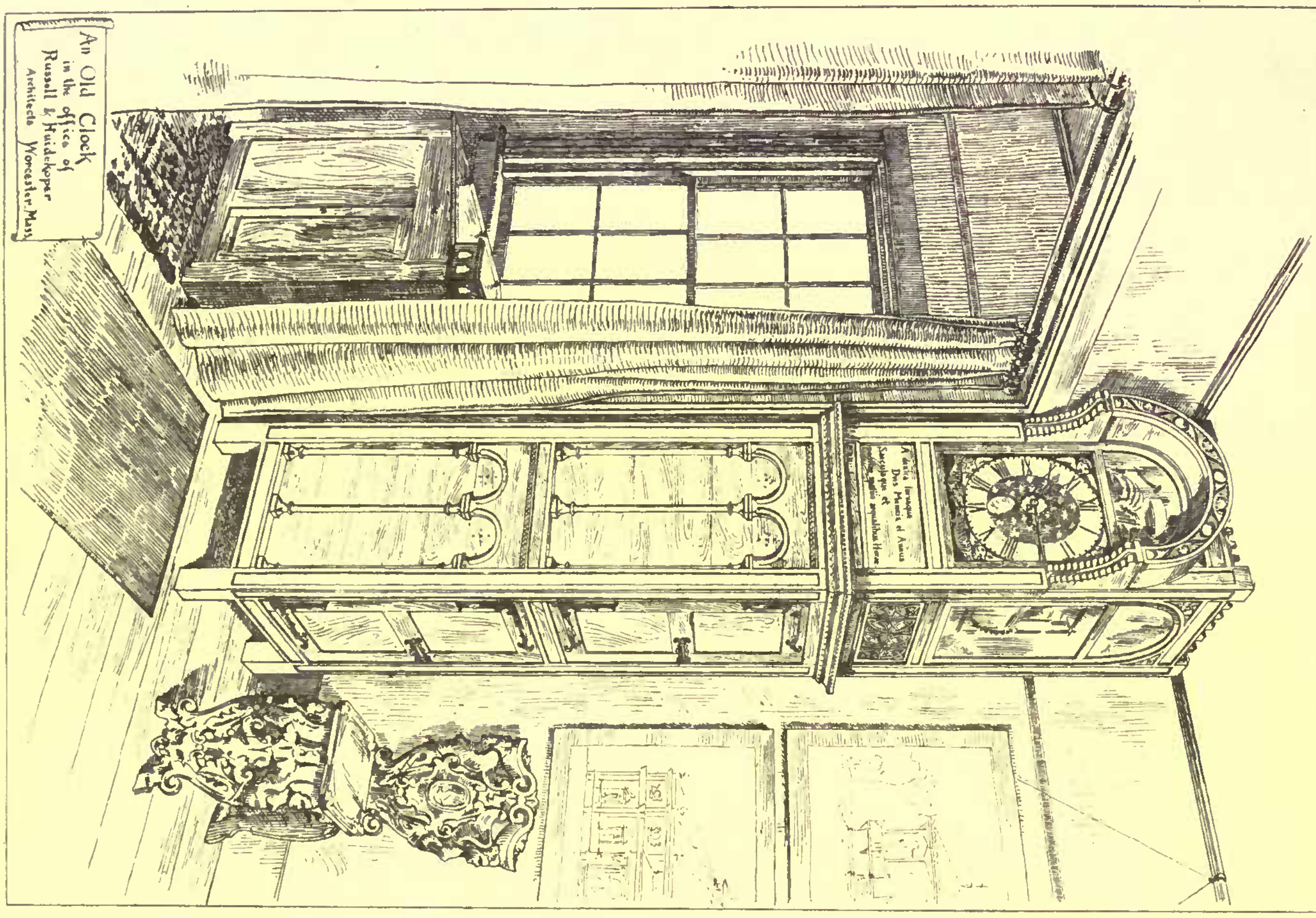
A Tower at Maestricht, Holland.

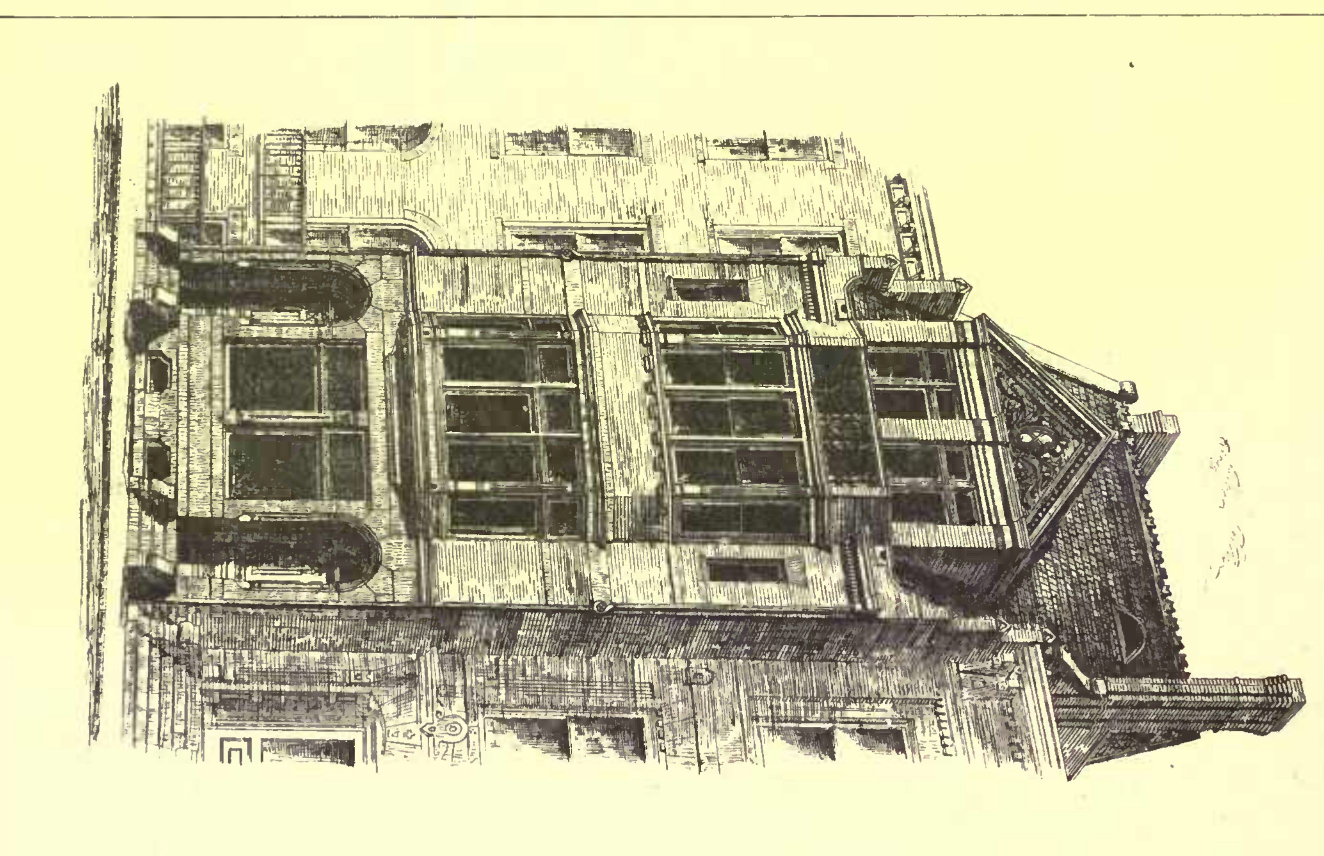
ARCHITECTURE has now a room of her own at Burlington House. During the past year Mr. Norman Shaw has been engaged in adding three new galleries to the already overgrown number of rooms, so that there are now eleven rooms set apart for oil-paintings, two, the central hall and the lecture-room, for sculpture, a new room for water-colors, another for architecture, and a third for engravings and etchings. There are over two thousand works in the exhibition, and the whole place strikes one as getting far too big and not nearly select enough. Many works are hung far too high, and they are all too crowded together, so that it is quite impossible to do justice to much more than half the number on the walls. To revert to the new rooms, that for water-colors is the finest of the three. It is a square, well-proportioned apartment, with a deep cove enriched with good plaster-work. The "black and white" room opens out of the last, and is a small cabinet, but quite large enough for its purpose. The architectural room is a parallelogram in plan, rather too narrow for its length, and hardly large enough, to our thinking. It has octagon angles running up about ten or twelve feet high — a pleasing as well as useful feature, as the drawings on these angles are seen to very good advantage. It has a plain panelled frieze and a lantern light running the whole length of the room. The ceiling is manifestly unfinished, and we can well imagine Mr. Shaw intends doing something more with the frieze and the ceiling than at present meets the eye. The three new rooms have handsomely moulded doorways and low dadoes all in American walnut; between the dado and the cornice the walls are covered with a paper in pleasing pattern in two shades of red — a very good tone for both color and line drawings. The rooms, as a set, are much more artistic in feeling and detail than the old galleries out of which they open, so that one wishes Mr. Shaw would take the latter in hand as well and see what he can do to improve them — the old water-color gallery, for instance, is a caution.

In the architectural room there are hung some two hundred and twenty-five works, none of them very large, but from the high average quality of the display we think the architects have fairly justified the position they hold in the Academy and the need for the better accommodation now provided. We have to regret the absence of any work from Mr. Norman Shaw, and, again, for the second year of anything from Mr. Bodley. This is far from satisfactory to begin with, but Mr. Pearson and Mr. Waterhouse are both in evidence. Mr. Pearson sends his design, shown in elevation and section, for the great central tower and spire of Peterborough Cathedral, which it has just been decided is not to be carried out. The Norman arches at the crossing, and all the Norman work in the stages immediately above them are carefully restored; above this rises a lofty belfry stage in fourteenth-century Gothic with parapet and pinnacles, the whole being crowned with a magnificent spire. It is certainly the finest tower and spire we have ever seen Mr. Pearson design, whatever may be said on the side of archæology: it is much to be regretted such a splendid opportunity is to be lost to us from a purely architectural point of view. Mr. Pearson seems to be most unfortunate in the matter of his towers; the majority of his great churches are still waiting for them; alas, we fear they may wait too long, as far as he is concerned, and this makes it all the more regrettable that now the Peterborough spire is not to be done at all. We must say a word as to the drawings of this spire. They are most beautifully executed, full of the spirit of mediæval work. Mr. Pearson sends also his drawings for the Restoration of Westminster Hall, about which much has been written and spoken lately. It is some satisfaction to think that *they* at least are to be carried out. One select committee which has been sitting on the matter for months past have at last agreed to approve of Mr. Pearson's designs, leaving only the question of the raising of the towers of the hall until a future time; doubtless, now, the whole will be carried out as Mr. Pearson wishes.

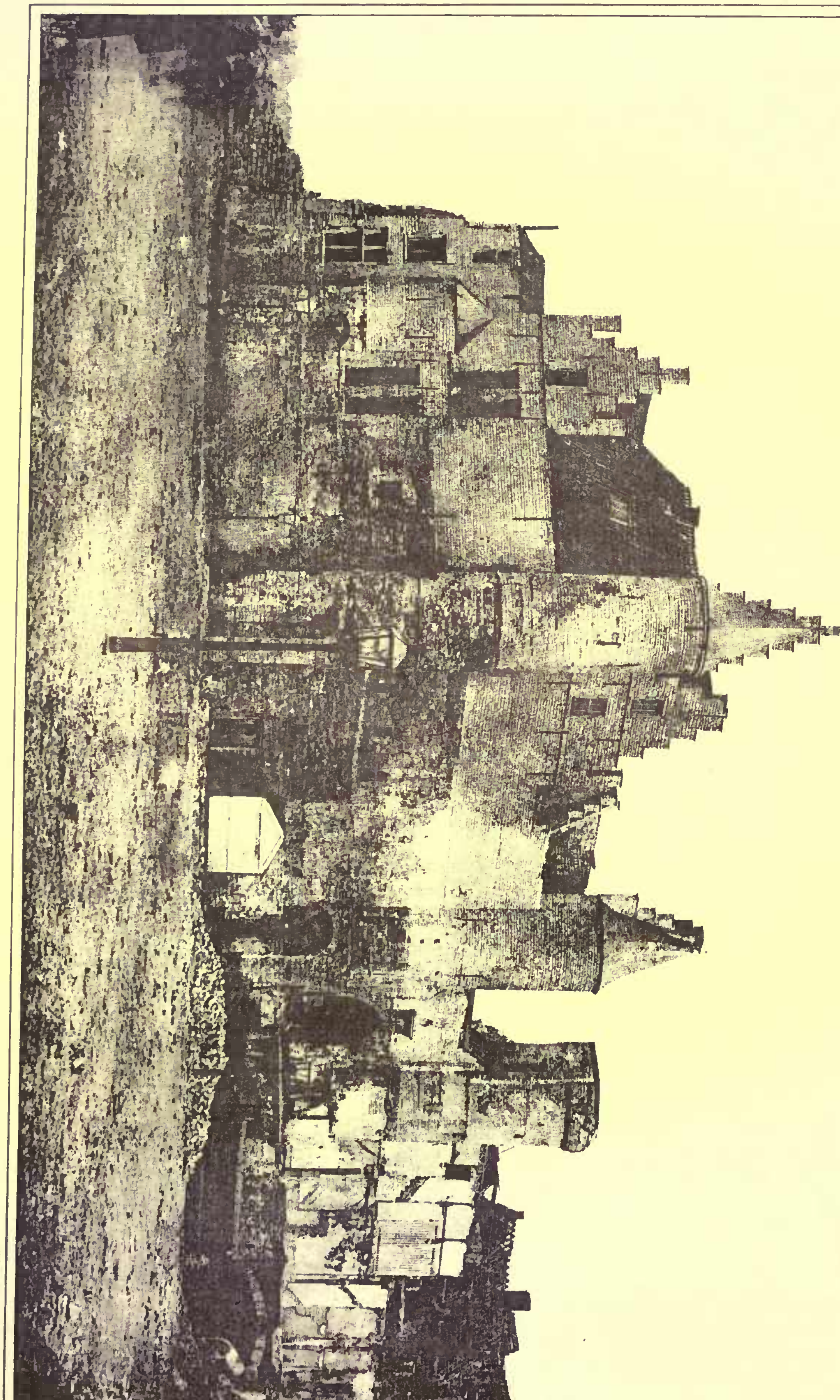
Mr. Waterhouse sends in one of his masterly water-colors, his design for the National Liberal Club — a clever Renaissance work. The only incongruity is the great tower at the angle, which really seems to belong both to a different style and a different building. The more one looks at it the more one is convinced there must be something wrong somewhere. The two are quite out of harmony with each other, so that the tower looks like an after-thought, and not the proverbial "best" of second thoughts this time.

The other Associate, Mr. George Aitchison, has a view of the interior of Royal Exchange Assurance Office, Pall Mall, — a design of little interest, principally remarkable for its enriched plaster ceiling. Mr. T. G. Jackson is strong in collegiate work. First we have the new quadrangle of Trinity College, Oxford, in its architect's favorite style — a little bit restless, perhaps, but with many fine "bits" and details about it, particularly the double gable of one of the returning wings, which, with its tall chimney shafts and carefully designed windows, has a most telling effect. It is altogether a most important work, and looks thoroughly like Oxford itself, as all Mr. Jackson's work there does. The new buildings in Merton Street, for Corpus Christi College, have also the Oxford feeling about them, though not



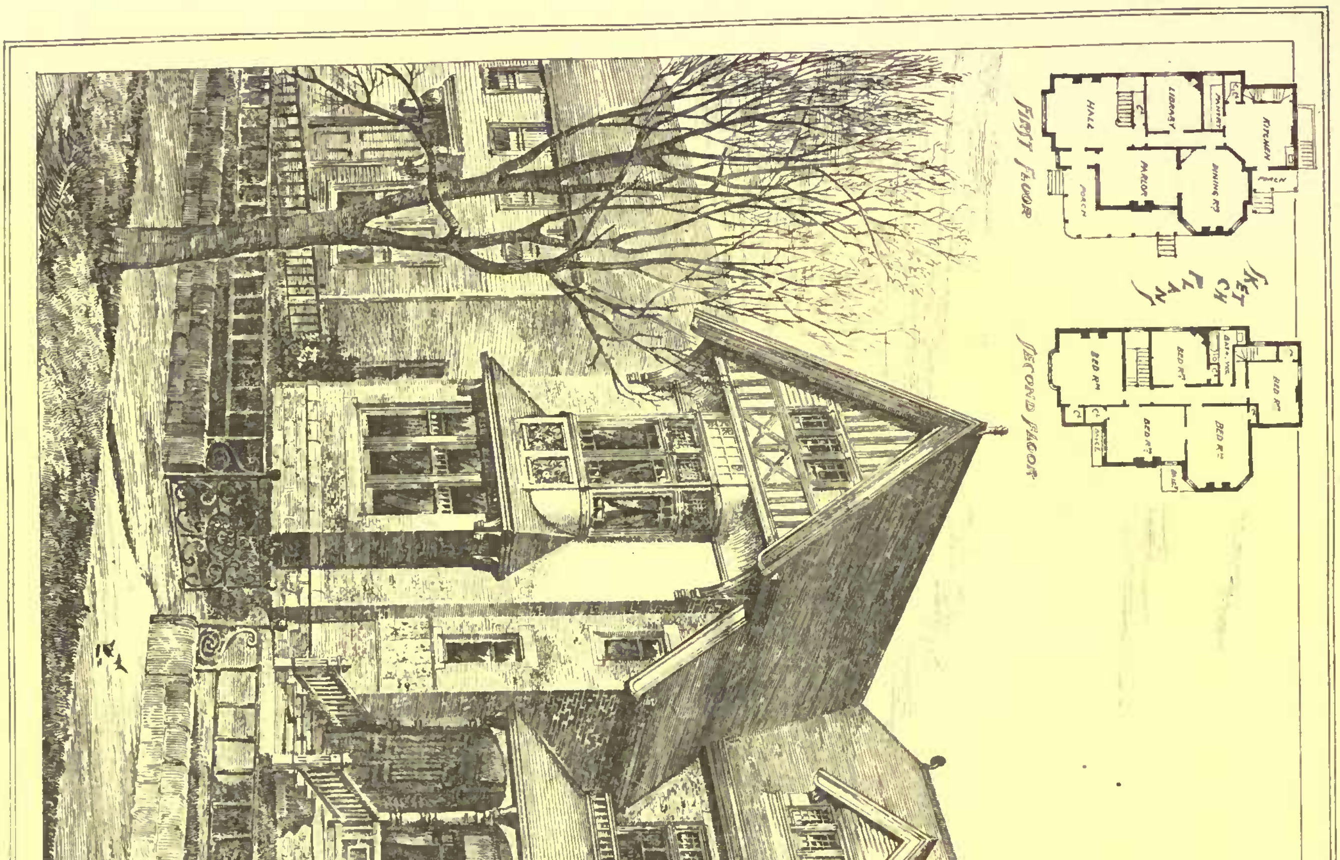


HOUSE FOR DR H.A. SMITH 128 W. 8TH STREET CINCINNATI — S.E. DES JARDINS, ARCHT.



Museum of Antiquities, Antwerp, Belgium, – 1884.

HELIOTYPE PRINTING CO BOSTON

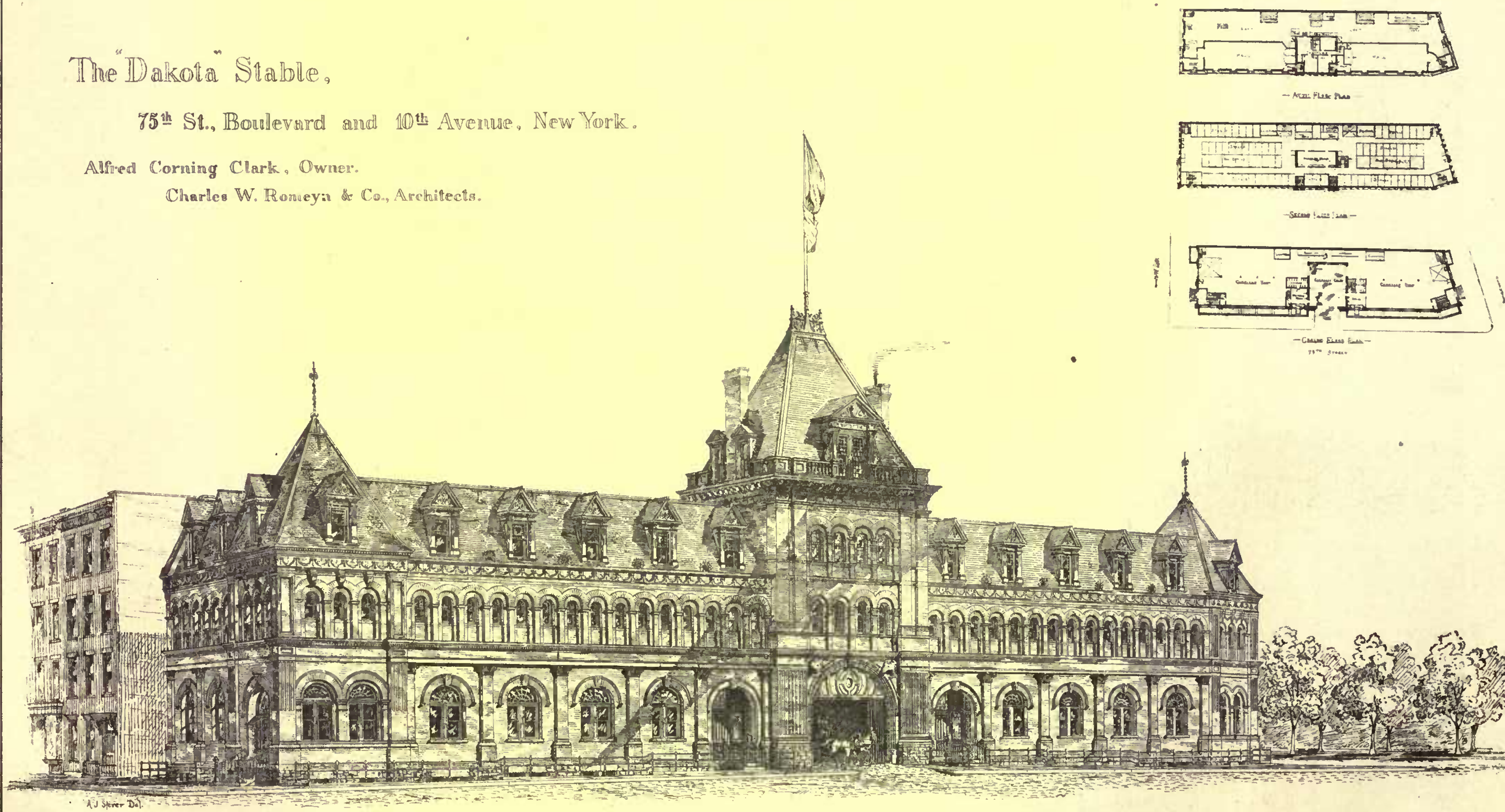

THE RESIDENCE OF
H. L. RICHMOND ESQ. JR.
MEADVILLE
W. G. FRASER ARCHT. PITTSBURGH PA.
FIRST FLOOR
SECOND FLOOR
HALL
LIBRARY
KITCHEN
PARLOR
DINING RM
PORCH
BED RM

The "Dakota" Stable,

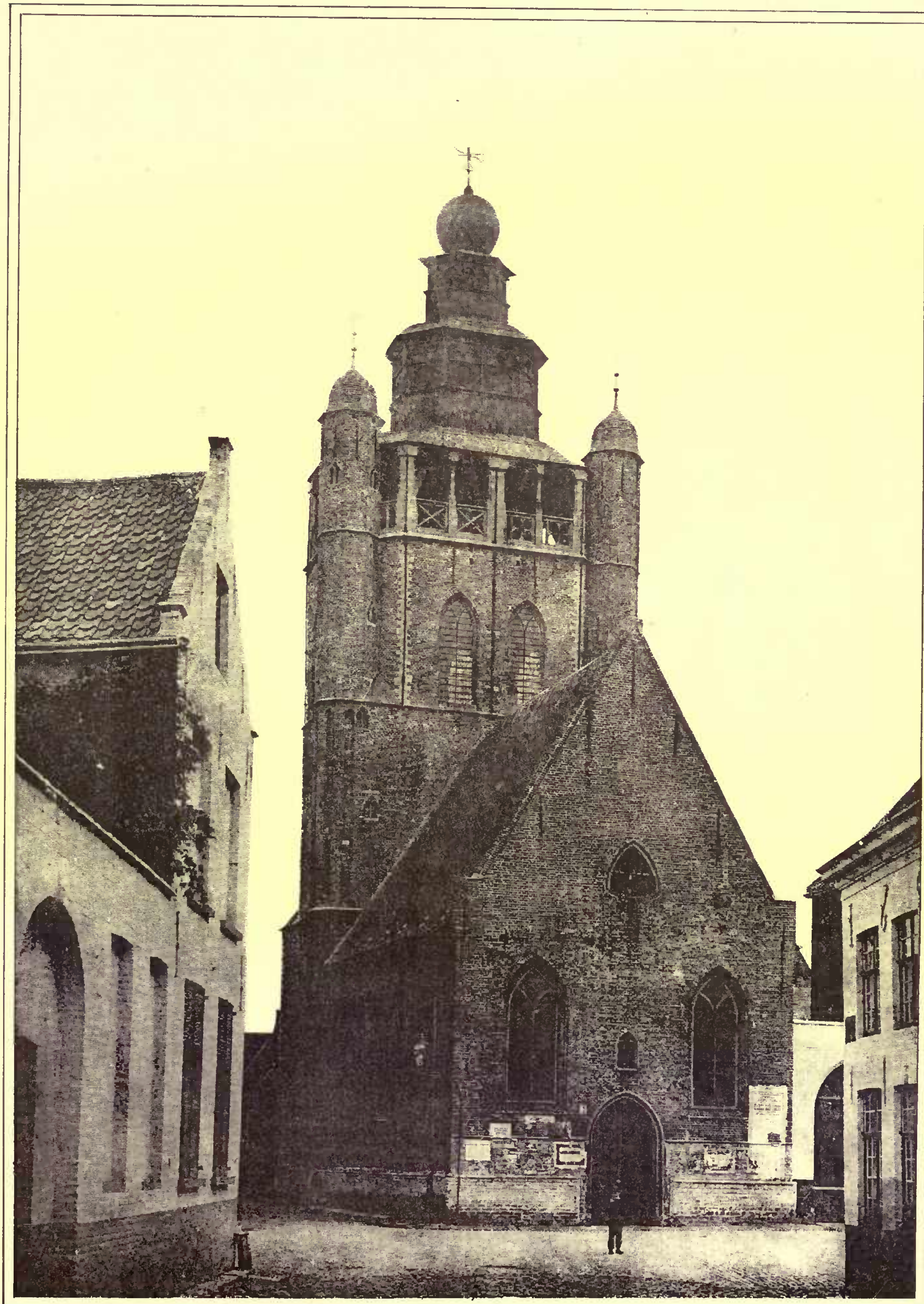
75th St., Boulevard and 10th Avenue, New York.

Alfred Corning Clark, Owner.

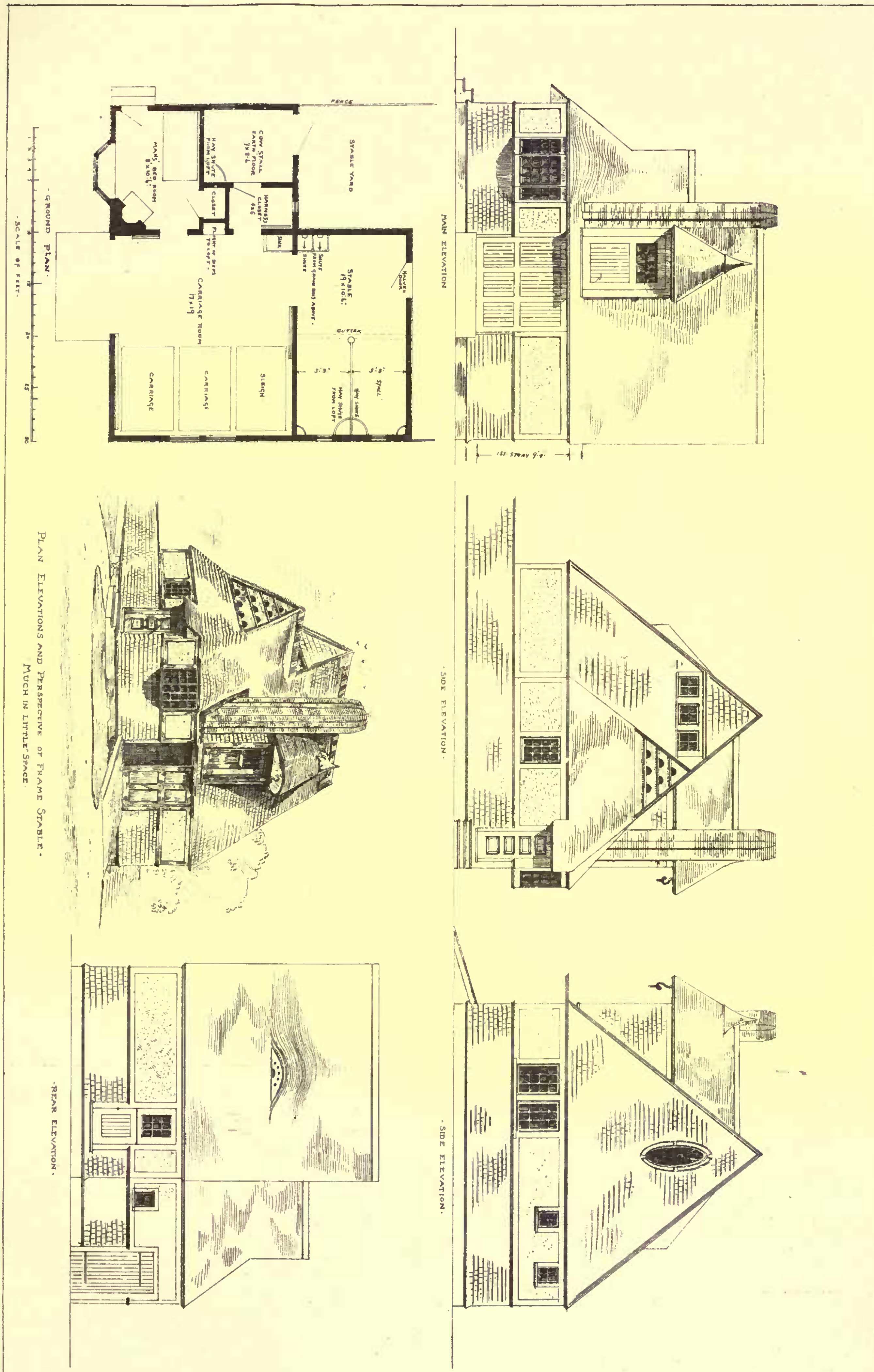
Charles W. Romeyn & Co., Architects.



HELIOTYPE PRINTING CO. BOSTON



TEMPLE DE JERUSALEM, BRUGES, BELGIUM. — 1884.



PLAN ELEVATIONS AND PERSPECTIVE OF FRAME STABLE.
MUCH IN LITTLE SPACE.

HELIOTYPE PRINTING CO. BOSTON.

on so ambitious a scale as those just noticed. Mr. Jackson also sends two drawings of his Brighton College. This is more Gothic in style than his Oxford work — Tudor, we might call it, for want of a more appropriate name. One view shows the interior of the quadrangle, with the hall, chapel and boarding-houses, in which a picturesque tower forms a prominent feature. The other view is the entrance gateway and tower — a most effective group, thoroughly well designed and most carefully detailed. It is really a pleasure to see such good work as this being done at our colleges and schools, showing that they are quite abreast of the times in their efforts to secure high-class architectural surroundings, and which, let us hope, are not without their influences on the young minds thronging their halls and class-rooms. In this connection we must notice Mr. Basil Champney's Indian Institute at Oxford, and also Mr. J. J. Stevenson's new Laboratory for Cambridge University, both in that phase of free Classic affected by their authors. The former has the failing of being rather too much broken up along the side elevation, but the front towards Broad Street is much better. A considerable amount of Indian character has been worked into the carving and other details, notably in the figures under the upper stage of the angle tower. The drawings as such, two elevations, are hardly worthy of the work, which is very effective in execution. Mr. Stevenson's Cambridge building is chiefly remarkable for the series of large Queen-Anne-looking windows in the principal front. It also is not by any means assisted by the drawing, a perspective, which shows it. Both are a long way behind Mr. Jackson's contributions in this respect. Is it that he is much the best draughtsman of the three? We fancy it must be so.

Taking the collection more seriatim we find at the beginning some remarkable specimens of beautiful draughtsmanship, as in the Shakespeare tower of the Memorial Theatre, Stratford-on-Avon, by Mr. W. F. Unsworth, a most striking piece of work, with a bridge and covered way over it leading to the tower, all very cleverly designed and likely to be seen by many American visitors to Shakespeare's town. Following this are two equally effective drawings by Mr. Flockhart of a house and studio he has built for Mr. Mac Whirter, A.R.A., in St. John's Wood. The house is clever enough in design, but the drawings, as such, are most admirable in their breadth of treatment and simplicity of effect, unsurpassed in this respect by any in the room.

In quite a different type and style is Mr. Phené Spiers's design for the central portion of a public building — a remarkably good piece of Classic work, sustaining to the full his reputation both as draughtsman and designer. One cannot help wishing the coming War Offices were as good Classic as this. Another admirable drawing by Mr. Spiers is the entrance to Mr. W. Edis's Constitutional Club, Northumberland Avenue, showing a very rich design now being carried out in red and buff terra-cotta, the only regret being that for such an important building some more noble material, such as stone or marble, or both, should not have been employed. We have got into a kind of terra-cotta craze just at present. How much one well-known member of the Academy is responsible for it we would hardly like to say, but like most crazes it seems to be catching, and we are being treated to important works in hard and somewhat rough terra-cotta, which a few years ago would have been built in more sympathetic stone and brick, and we cannot say the change is a welcome one, either from an artistic or a constructive point of view. Let us hope that as the fit is a sharp one it may pass as quickly away, and leave us wiser and better for the future.

Two or three fine examples of church work hang together near the beginning of the room. The proposed restoration of the south transept of Chester Cathedral, by Mr. A. W. Bloomfield, is shown in a beautiful drawing. Its principal feature is a great fourteenth-century window; but how much of this is really old and how much "restored," it is impossible to tell without a drawing of the front "as it is at present." If the work is carried out as well as it is here drawn, it promises to be a great success. Then there is the "Church of St. Hilda," Whitby, by Mr. R. I. Johnston, of Newcastle, one of the best architects in the north of England. It is a very fine church in late Gothic, with a great square tower at the crossing. And, lastly, there is the design for a proposed new church in the diocese of Ely, by Mr. J. D. Sedding. This is a wonderful church in the way of planning. It has a wide nave with passage-like aisles and a morning chapel, all fitted into an irregular piece of ground, with great skill and picturesque effect. The nave has a low arcade and a very tall clerestory, and the general style of the architecture is fourteenth-century Gothic. The nave has a flat wooden ceiling, and some not very attractive colored decoration is shown on the east end of the chancel. The whole treatment, however, is very skilful, and has considerable originality in many of its features. Another work by Mr. Sedding follows closely after this, namely, "St. Saviour's Church and Parsonage," Sunbury-on-Thames. It is shown by a bird's-eye view, and has again much originality in its treatment. Its general features are late Gothic in character, with a touch of Flemish feeling here and there in some of the details. Its most noteworthy feature is probably the quaint, saddle-backed belfry-tower at the west end, underneath which is the baptistery. It is most picturesquely designed. The church has a wide nave and aisle-like passages again, but somehow the parsonage does not front very happily with the main building of the church. Before leaving Mr. Sedding's contributions, we must mention the working-drawing of the Pastoral Staff for the Bishop of Connecticut, which should be of special interest to American visitors to the gallery. It is a charming design and shown in a thoroughly good, practical drawing. Mr. Sedding has evidently given the subject most careful study, and the result is a very high-class work of art for the diocese of Connecticut, where it is to be hoped it will be as highly prized as it deserves to be.

In Nos. 1756 and 1757 we have two nice views of the additions to Stowell Park, Gloucestershire, by Mr. John Belcher, a quaint, charming country house in the quiet old English style, which always looks in keeping with an English landscape. The additions are evidently carefully carried out in harmony with the previous work.

Messrs. George & Peto are, as usual, strong in domestic work. A large country house at Woolpits, Surrey, begins their contributions. It is an important work, and designed with all that picturesqueness for which they are so well known. The hall and the tower are the principal features, perhaps, but there are others equally worthy of study in that they have been carefully studied themselves. Even better, perhaps, is their "House at Ascott," a charming English country house, with a private chapel attached. There is some clever planning in it, also, and the manner in which the veranda is worked-in is worth the attention of all interested in such a feature. The "veranda" has not the importance with us that it has in America, so as a subject it has not probably had the same amount of study in the old country as in the new, but here is an example worth noting, in that it is part and parcel of the house, and not simply stuck on against a wall, as in too many instances. There is also a town house at "Collingham Gardens, Kensington," by George & Peto, which is much the same in style as several they have done in the same neighborhood. One cannot leave these designs without again bearing testimony to the charming manner in which they are drawn. In brown ink, with washes of warm brown color, Mr. George has developed a style quite his own, and which we notice has already a few followers in the Exhibition. They also send a drawing of their Eardley Memorial Church, at Streatham, but it is not by any means equal to their domestic work.

There is a very clever design for a "Town Gate-House and Bridge," by Mr. E. G. Dawber, one of the Royal Academy students, which is much above the average of student's work generally. It is both well-drawn and well-designed, and gives much promise for the future of its young author. In this connection, also, we may mention another student's design, that for a "municipal mansion," by Mr. Arnold Mitchell, also very clever and picturesque, — rather too much of the latter. This is one of the drawings, both in design and draughtsmanship, which we referred to as following Mr. Ernest George. He has evidently been in Mr. George's office or come under his influence, as it is full of his style and feeling.

Near this is Messrs. Weatherby & Jones's new Hatchett's Hotel and White Horse Cellars, Piccadilly, well known as the headquarters of the coaching interest, and the scene here between ten and eleven on a fine summer morning quite carries one back to the good old coaching days, so many fours-in-hand are starting on their different journeys. The new hotel, however, does not quite recall the old associations. It is very "new," Queen Anne of the most fashionable type, with scrollified gables, tall chimneys, and all the rest of it. It is rather too fussy; though the detail is in many respects good, it is too much cut up, as if the authors had tried to get in everything they could. The White Horse Cellar is still "a cellar," and that's about all that is left of the old features of the house.

INLAND NAVIGATIONS IN EUROPE.[1]



A Tower at Maestricht Holland.

THE lecturer premised that his professional experience being mostly in connection with the great rivers of Continental Europe, his remarks on the inland navigations of Great Britain would be brief. The lower parts of the chief rivers of the United Kingdom were mostly arms of the sea, navigable at high water by ships of the largest burden. The principal waterway, the Thames, was navigable for about one hundred and ninety-four miles, and was united by means of a grand net-work of canals with the Solent, the Severn, the Mersey, the Humber, and the Trent, being thus in direct communication, not only with the English and Irish Channels, but also with every inland town of importance south of the Tees. Other river and canal navigations were briefly noticed, among them Telford's masterpiece, the Caledonian Canal, and the estimated length of inland waterways in the United Kingdom was given as five thousand four hundred and forty-two miles, which had been constructed at a cost of £19,145,866.

Turning to the Continent, Russia next claimed attention as having the greatest extent of water communications. Its principal highway was the Volga, the largest river in Europe, which, in a course of more than two thousand miles, drained an area of five hundred and sixty-three thousand square miles, and afforded, with its tributaries seven thousand two hundred miles of navigation, but of very unequal capacity, owing to the shallow depth of some portions.

[1] The fourth of the course of special lectures on "The Theory and Practice of Hydro-Mechanics" delivered at the Institution of Civil Engineers, on Thursday evening, the 19th of March, by Sir Charles A. Hartley, K.C.M.G., M. Inst. C.E., the subject being "Inland Navigations in Europe." The chair was occupied by Sir Frederick J. Bramwell, F.R.S., the President.

Hitherto, no permanent works had been undertaken to improve the navigation of the Volga, but dredging had been resorted to in the lower part of the stream, and recently a system of scraping by iron harrows had been employed, which was stated to have doubled the depth of water over certain shoals in a few days. In the lecturer's opinion the Russian Government would hesitate a long time before embarking in costly improvement works, the effect of which would be very uncertain. Other important water communications in Russia were the Caspian — an inland sea of one hundred and sixty thousand square miles extent; the River Don, nine hundred and eighty miles in length, and draining one hundred and seventy thousand square miles; the Dnieper, draining two hundred and four thousand square miles and with a course of one thousand sixty miles. Of secondary rivers, the Bug, the Dniester, the Duna and the Neva were all navigable; in the case of the latter short, but most important means of communication, a maritime canal eighteen miles in length had recently been completed to unite Cronstadt with St. Petersburg. About nine hundred miles of canals had been constructed in European Russia. In most instances they had been formed with but little difficulty, across the gentle undulations of the great watershed, the object being to connect the head-waters of rivers which had their outlets at opposite extremities of the continent.

Sweden abounded with lakes, which covered more than fourteen thousand square miles of its surface, but none of the rivers were navigable except those which had been made so artificially, nearly all of them being obstructed by cataracts and rapids. Nevertheless, Sweden possessed remarkable facilities for internal navigation during the seven months that the country was free from ice, intercourse being carried on by means of a series of lakes, rivers, and bays, connected by more than three hundred miles of canals. Of the latter, the most celebrated was the Gotha Canal, designed under the auspices of Count von Platen, by Telford, the first President of this Institution.

Germany owned parts of seven river valleys and three large coast streams, viz., the Niemen, the Eyder, the Vistula, the Pregel, the Oder, the Elbe, the Weser, the Ems, the Rhine, and the Danube. Of these the Weser was the only one which belonged wholly to Germany, while of the Danube but one-fifth part ran through her territory. The hydrography of all these rivers was briefly described. The inland navigations of Germany were of the most advanced character, an immense trade being carried on upon them by means of barges and rafts. In the case of the Elbe, the system of towing by submerged cable had taken a large development. As early as 1866 chain-tugs were running on two hundred miles of its course, and in 1874 this mode of traction had been so increased that there were then twenty-eight tugs running regularly between Hamburg and Aussig. These tugs were one hundred and thirty-eight feet to one hundred and fifty feet long, twenty-four feet wide, with eighteen inch draught. On the Upper Elbe the average tow was from four to eight large barges, and, taking the ice into consideration, there were about three hundred towing-days in the year. It was found that large vessels paid best; thus, in the case of the Hamburg-Magdeburg Navigation Company, the cost of transporting a cargo from Hamburg to Dresden — a distance of three hundred and fifty miles — for barges of one hundred and fifty tons, three hundred tons, and four hundred tons, was respectively 11*s.* 6*d.*, 9*s.* 9½*d.*, and 9*s.* 4*d.* per ton up stream, and 4*s.* 4½*d.*, 3*s.* 2½*d.*, and 2*s.* 9½*d.* per ton down stream. Although Germany possessed a length of nearly seventeen thousand miles of navigable rivers, or more than double the combined length of the navigable streams of the United Kingdom and France, it could not be said to be rich in canals. In South Germany the Regnitz and Ludwig Canals, from the Main at Bamberg to the Danube, were the only ones of importance until the annexation of Alsace-Lorraine. The North German plain had several canals, the most important of which were referred to in the remarks on the chief river systems of the empire. In 1878 the total length of the seventy canals of Germany was only twelve hundred and fifty miles, a very small extent when compared with the other canal systems of Western Europe.

Holland possessed the great advantage of holding the mouths of the Rhine, the Maas, and the Scheldt. Her means of river communication with Germany, France, and Belgium, were unbounded, and the possession of a length of nine hundred and thirty miles of canals and three hundred and forty miles of rivers enabled her, apart from her railways, to carry on her large trade with greater facility of transport than, perhaps, any other European country. One of the principal artificial works in Holland was the North Holland Canal, constructed by Blanken in 1819–25, at a cost of nearly £900,000, and esteemed the greatest work of its day; it was fifty-two miles long and eighteen feet deep. It had now been almost superseded by the Amsterdam Canal, constructed by Sir John Hawkshaw, and of which a detailed account was to be found in the Minutes of Proceedings.

Belgium shared with her northern neighbor the advantages of an elaborate system of waterways. The principal were the Meuse and the Scheldt. The total length of the Meuse, which was canalized at difficult places, was five hundred and eighty miles, of which four hundred and sixty miles were navigable. But by far the most important river of Belgium was the Scheldt. Thanks to its unique position at the head of a tidal estuary, to the abolition of the Scheldt dues, and to the foresight and liberality of the Belgian Government, which had spent £4,000,000 on dock and river works since 1877, Antwerp had now become in many respects the foremost port of the Continent. Besides her seven hundred miles of navigable rivers, Belgium possessed about five hundred and forty miles of canals, by means of which communication existed between all the large towns and chief seaports of the kingdom.

France had built up, and was constantly extending, an elaborate system of canals and canalized rivers. Of the latter the Seine was the most important in regard to the artificial works undertaken for its improvement, and for the tonnage of the traffic, which was in 1872 more than one-eighth of the whole water-borne traffic of France. The lecturer successively passed in review the Loire, the Garonne, and the Rhône, all of which important rivers had been largely benefitted by the art of the engineer. The canal system of France was historic, one of the earliest of these artificial cuts being the celebrated canal of Languedoc, one hundred and seventy-one miles long, and built by Riquet in 1667–81, and now forming part of the Canal du Midi. From its summit level, six hundred feet above the sea, it communicated with the Garonne, and therefore with the Atlantic, by twenty-six locks, while its southern slope descended by seventy-three locks to the Mediterranean. Statistics were given showing that, up to 1878, on seven thousand and sixty-nine miles of waterways, France had spent upwards of £43,000,000, or considerably more than double spent by the United Kingdom up to 1844. Nevertheless, it was intended still further to extend, improve, and systematize this means of communication, at an estimated further cost of £40,000,000.

Spain and Portugal possessed partly in common eight principal rivers, of which five, the Minho, Douro, Tagus, Guadiana, and Guadalquivir, drained the western valleys and flowed into the Atlantic, while the other three, the Ebro, Jucar, and Segura, discharged into the Mediterranean. The characteristics of these rivers were described. As a rule they were only navigable for a limited portion of their course, and were chiefly remarkable for the exhibition of peculiar natural phenomena and of extremes of flood discharge, a velocity of sixteen knots an hour having been noted in the Douro under certain conditions of tide. The canals of the Iberian peninsula were unimportant; Spain possessed a length of one hundred and thirty miles in 1875.

Italy was not rich in waterways except in the valley of the Po, the navigable portion of her rivers only attaining an aggregate length of eleven hundred miles. Of these the Po, the Adige, and the Tiber were the chief, and their principal points were discussed by the lecturer. Although the total length of navigable canals in Italy was only four hundred and thirty-five miles, the Italians were the first people of modern Europe that attempted to plan and execute such artificial waterways. As a rule, however, they had been principally undertaken for the purposes of irrigation. Of the Italian canals the most important were the Cavour Canal in Piedmont, the Grand Canal in Lombardy, and the canals of Pavia and Martesana. The provinces of Venice, of Padua, and the Emilia had all excellent canal systems.

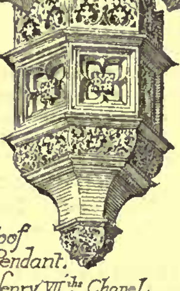
Austria-Hungary possessed in the Danube the largest river in Europe, as regarded the volume of discharge, although it was inferior to the Volga in the length of its course and the area of its basin. This great stream first became navigable for flat-bottomed boats at Ulm, one hundred and thirty miles from its source. In its total length of seventeen hundred and fifty miles it was fed by at least three hundred tributaries, many of them large rivers, such as the Inn, the Drave, the Save, the Theiss, the Olto, the Sereth, and the Pruth. Indeed, the seven tributaries mentioned had a combined length of twenty-nine hundred miles, and drained one-half of the Danube basin. The navigation interests of this grand river system were of the highest importance, both from the commercial and the engineering points of view, and the lecturer dwelt at length on the works of improvement executed under different governments and administrations, dividing his remarks under three heads, namely, the Upper and Middle Danube, the Lower Danube, and the Mouths. After leaving Bavaria, the upper and middle section of the river passed through Austro-Hungarian territory, and had been the subject of continuous and unceasing effort in the direction of improving its capacity for navigation. Although the Danube between Vienna and Old Moldova had been regulated in numerous places and at great cost, there had been but little appreciable improvement effected in its general navigable depth. On this account, projects having in view the permanent acquisition of a sufficiently wide channel of from six feet to eight feet deep at every point between Passau and Basias had lately been prepared by Government engineers, which involved an outlay of £2,000,000 to effect the desired improvements. Traffic on the Upper and Lower Danube was mostly carried in about eight hundred barges belonging to the Danube Steam Navigation Company, of which the greater number gauged two hundred and fifty tons. Much valuable information respecting the mode of traction on the Middle Danube has been procured from Mr. Murray Jackson, the engineer of the company in question, to whom, as well as to several other correspondents who had likewise kindly aided him in procuring information on other matters connected with his discourse, the lecturer tendered his acknowledgments.

The Lower Danube began at the foot of the Iron Gates, and terminated at the outfall in the Black Sea. The principal features of this section of the river were described, and it was stated that between the Iron Gates and Ibraila there was frequently a depth of forty feet at low water, but at seasons of very low water this depth was not more than nine feet, and at the Nicopoli, Sistov, and Tchernavoda shoals it was reduced to seven feet, six feet and four and one-half feet respectively.

In conclusion, an account was given of the works undertaken by

the International Commission, to which body the lecturer was appointed engineer in 1856, and had designed and carried out the works at the Sulina mouth now on the eve of completion. The achievement of the programme of the Commission had resulted in there being everywhere a navigable depth of from seventeen feet to twenty feet at the season of high water, and a minimum depth of fourteen feet at low water. In the Sulina branch, nine of its worst shoals had been successfully dealt with, and three cut-offs had been made, by which the river had been shortened two miles, and eight of its worst bends entirely suppressed. The total cost of these river-works, including maintenance and dredging, had not exceeded £300,000. At the Sulina mouth, where there was only a depth of from eight feet to ten feet before the construction of the piers, the depth for many years past, unaided by dredging, had not been less than twenty and one-half feet. The cost of the piers, including their maintenance to the present time, had been about £220,000. The effect of these improvements had been to increase the trade from six hundred and eighty thousand tons gross in 1859 to one million five hundred and thirty thousand gross tons in 1883, and to lower the charges on shipping from an average of 20*s.* per ton for lighterage before the deepening of the Sulina mouth and the improvement of its branch, to 2*s.* per register ton at the present time for commission dues. As a commentary on the hostile criticism evoked when the scheme was initiated, the lecturer drew attention to two facts, namely, that the works so unsparingly criticised in 1857 had already effected a saving of £20,000,000, and that experience had abundantly proved that the predictions of a rapid silting-up to seaward of the Sulina piers had been completely erroneous.

THE BUILDING STONES OF INDIANA.


Roof Pendant. Henry VII.th Chapel. Westminster Abbey

IN the Report of the Geological Survey of Indiana for the year 1878 is a useful chapter on the occurrence and physical properties of the building stones of that State, from which we are enabled to make the following summary.

The State of Indiana is extremely rich in this essential material. The limestones, however, constitute by far the most characteristic and valuable building stones of the State. In the following we give a summary of the qualities of the more important of these:

North Vernon Bluestone. — This stone is a bluish-gray limestone, moderately close-grained, with slightly conchoidal fracture, lying in seams from one to two feet thick. The principal centres where it is quarried are North Vernon and Deputy. The total exposure of the North Vernon blue stone is about 30 feet thick, and the bed covers an extended area in Jennings and Jefferson counties. Geologically, it belongs to the Hamilton division of the Devonian. Of the entire exposure, two or three layers are considered of first quality. This stone has long enjoyed a fine reputation for massive masonry, such as foundations for public buildings, bridge abutments, etc.; where great strength and durability are essential requirements. Chemical analysis shows the stone to contain about 90 per cent of carbonate of lime, with about 2 per cent each of carbonate of magnesia and of alumina and silicates. Tests of crushing strength by Gen. Q. A. Gillmore gave 15,750 pounds to the square inch. One cubic foot weighs 165½ pounds, and the ratio of absorption is 1 : 156 — that is, a cubic foot will absorb less than a pint of water.

Greensburg, or Flat Rock, Stone. — This is a light-colored, close-grained, magnesian limestone, belonging, geologically, to the Niagara group, which underlies the Hamilton. It is extensively quarried at various localities in Dearborn County, but principally in the vicinity of Greensburg, on Sand Creek, and St. Paul, on Flat Rock Creek, in Decatur County. The crop is from 20 to 30 feet thick, the layers varying in thickness from 4 inches to 2 feet. Flagging may be obtained of this stone in flags 50 by 200 feet, and from 6 to 7 inches thick, without break or flaw, and which will not vary one inch in thickness over the entire surface. Stone 22 inches thick may be had of equal superfices, if it were possible to handle such masses. An analysis of samples from the Greensburg Stone Company's quarries gave as its composition 74.2 per cent carbonate of lime, with approximately 10 per cent of carbonate of magnesia, 6 per cent of insoluble silicates, 6½ per cent of oxide of iron and alumina, and about 2 per cent of chlorides of the alkalies. Gen. Gillmore gives the weight of a cubic foot as 169.98 pounds; the crushing strength of one cubic inch as 16,875 pounds; and ratio of absorption, 1 : 117.

Two samples of the same stone from Flat Rock Creek, near St. Paul gave about 83 per cent of carbonate of lime and 6 per cent of carbonate of magnesia. The weight of one cubic foot is 168.09 pounds; crushing strength per cubic inch, 16,000 pounds; and ratio of absorption, 1 : 336.

The last three stones referred to are magnesian, or dolomitic limestones. They represent a large class of building stones, quarried not only in Indiana, but also in the adjoining States of Ohio and Illinois, such as the Dayton stone of the former State, and the Joliet and Lamont of the latter. No building stones in the West have been more thoroughly tested, or are better known to architects and builders. Being more expensive to dress than the oölitic limestones (about to be spoken of), this stone has been chiefly used in Indiana for foundations and bridge abutments, for which purpose it is well adapted.

Among the most valuable building stones of Indiana may be classed the so-called oölitic limestones. They are of sub-carboniferous age, and chemically almost pure carbonate of lime. The most noted building stone of this series is obtained from strata believed to be the equivalent of the rocks that out-crop at St. Louis, and that are called St. Louis limestone in the geological reports of Illinois. The crop of this stone may be followed from Montgomery County on the north to Harrison County on the south. The workable beds are from 10 to 100 feet in thickness. The color ranges from grayish-white and bluish-gray to chalk-white. The structure, as before said, is oölitic (so named from its resemblance to the roe of a fish). The rounded segregated particles of which it is composed are sometimes so small as to be unrecognizable to the unaided eye, and again so large as to be quite conspicuous. It may be quarried in blocks of any size and thickness that may be desired. Professor Cox reports that he has seen blocks of it cut out by the steam channeler 6½ by 9½ inches in thickness and 42 feet long, and, at one of the Bedford quarries, a block of similar thickness and 66 feet long. At most of the localities where this stone is quarried, blocks of much greater length, thickness and width can be obtained if required; and, says Professor Cox, "Cleopatra's Needle might be duplicated, should a market be opened for monoliths of that character." Chemical analyses of this stone from widely separated localities yield from 96 to 98 per cent of carbonate of lime, showing it to be an almost chemically pure limestone, and of remarkable uniform composition.

The following record of tests of strength, etc., made on various specimens of this stone by Gen. Gillmore, will be useful for comparison: Simpson & Archer's stone, quarry located four miles east of Spencer, on the Indianapolis & Vincennes Railroad; weight of a cubic foot, 140.03 pounds; crushing strength per cubic inch, 7,500 pounds; ratio of absorption, 1 : 30.

Dunn & Co.'s stone, quarry near Bloomington; weight per cubic foot, 137.24 pounds; crushing strength per cubic inch, 13,750 pounds; ratio of absorption, 1 : 43.

Chicago & Bedford Stone Co.'s stone, quarry at Bedford; weight per cubic foot, 146.56 pounds; crushing strength per cubic inch, 11,750 pounds; ratio of absorption, 1 : 28.

Stockslager's stone, quarry in Harrison County; weight per cubic foot, 149.59 pounds; crushing strength per cubic inch, 10,250 pounds; ratio of absorption, 1 : 27.

The foregoing data represent very fairly the character of the oölitic limestone of the State. It is remarkably uniform in composition throughout the State, being a nearly pure carbonate of lime; its average density is about 150 pounds per cubic foot; and its ratio of absorption will average 1 : 30.

Concerning this stone, Professor Cox is authority for the statement that it exhibits along its outcrop a remarkable resistance to weathering, and presents a bold and well-defined face along the valleys. As a durable building stone, it has withstood the ravages of time in buildings for upwards of fifty years, and still retains the hammer and chisel marks nearly as sharp as when first cut. The density, as shown above, exceeds that of the celebrated English Portland oölite. It possesses, also, greater strength than this, and is less absorbent of water. The reliable sustaining weight of a square foot of English Portland stone is 82,000 pounds; that of the Indiana stone is 135,000 pounds.

Another excellent limestone is that found at Putnamville, in Putnam County. It is a close-grained, hard, siliceous limestone, occurring in layers varying from 5 to 22 inches in thickness. It contains about 66 per cent of carbonate of lime, and 27½ per cent of insoluble silicates, and very little magnesia. It is a very strong and durable stone; weight per cubic foot, 166.36 pounds, with a crushing strength of 11,750 pounds per cubic inch, and ratio of absorption, 1 : 170.

PUGIN'S ECCLESIASTICAL ORNAMENT.

ROCHESTER, N. Y.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Can the following work be obtained in this country, and at what price: — "Pugin's *Colored* Ecclesiastical Decorations?" If not, can you refer us to any *first-class* work on *colored* English Gothic architecture; where it can be obtained, and the cost? We wish colored plates. Yours truly,

WARNER & BROCKETT.

[WE do not know that Pugin's "*Glossary of Ecclesiastical Ornament*" can be found in this country, unless J. Sabin's Sons, 64 Nassau Street, New York City, may have a copy. — EDS. AMERICAN ARCHITECT.]

HOME OR FOREIGN SCHOOLS OF ARCHITECTURE.

CHICAGO, ILL.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I take the liberty of requesting your opinion as to whether schools of architecture in Germany or those in America offer greater advantages, from an artistic as well as practical point of view, to draughtsmen looking forward to future practice in America

An early answer through your valuable journal would greatly oblige
Yours, SUBSCRIBER.

[WE would recommend our correspondent to spend two years in an American architectural school, and afterwards a year or two in a German or French school, as his prejudices in favor of one or another nationality may incline him.—EDS. AMERICAN ARCHITECT.]

REFERRED TO OUR READERS.

NEW YORK, May 27, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Gentlemen,—Can you inform us if there are any books or pamphlets now published giving general information about the construction of large-sized hotels; their requirements, arrangement, plans, etc., and if so, where they can be had. You will greatly oblige us by sending any data you may possess on the subject, or informing us where we can procure the same.

Yours truly, JOHN M. CARRÈRE.

SAN ANTONIO, TEX., May 25, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Will you, or any of the readers of the *American Architect* kindly answer the following questions:—

1. Has "sgraffito" been employed anywhere in the United States?
2. By whom, on what building, and when?
3. If used, was it successful or unsatisfactory?

If any of our professional brethren in this country have experimented with or used "sgraffito," we would be pleased to hear from them.

Yours respectfully,
WAHRENBERGER & BECKMANN.

NOTES AND CLIPPINGS.

FATE OF THE DUBLIN EXHIBITION BUILDING.—The structure of glass and iron which was once the Dublin Exhibition of 1872 has, after a somewhat checkered career, risen Phœnix-like from its ashes, and reposing on a solid foundation formed from the débris of the old Law Courts at Westminster, and adorned with the marble columns and conservatories which once belonged to Baron Grant, is now the Albert Palace at Battersea.—*Exchange.*

TEMPLE BAR.—The numbered stones of old Temple Bar are soon to be put together and set up again in the King's Bench Walk, within the quiet precincts of the legal microcosm within a city, not a hundred miles from the fountain which was Tom Pinch's trysting place, and the slab which marks Noll Goldsmith's grave. This is better than consigning the monument to the sordid companionship of sham ruins and pinchbeck cenotaphs in the gardens of the Hall-by-the-Sea, at Ramsgate.—*Exchange.*

ONE OF THE EVILS OF NATURAL GAS.—The legal papers in a nuisance suit against the Penn Fuel Gas Company, the largest natural gas company of this locality, will be filed to-morrow by M. Woodward, attorney for William Metcalf and other residents of Cliff and Fulton Streets. For several weeks this gas company has been blowing off its surplus gas on the hill overlooking the Union Depot. At night the gas is lit, and the roaring, together with the light and heat, has so annoyed the neighboring residents that they will ask the courts to declare it a nuisance. They say that they cannot sleep, and the glare from the light is intolerable. The company answers that it must have an escape for the gas.—*Pittsburg Correspondence of the Philadelphia Press.*

OUTLOOK FOR THE GEORGIA MARBLE QUARRIES.—Several of the leading merchants in Chicago have for some time been very much interested in the development of marble quarries in Georgia. These gentlemen told wonderful stories about the extent of the deposit there and the quality of the product. Shipments made to Chicago found ready sale, and several of the new and finest buildings in Chicago, notably the Chamber of Commerce, have been supplied with Georgia marble. While admiring and preferring it to either the Italian or Vermont marble, the marble dealers who became acquainted with the Georgia marble were still very sceptical about its existence in any quantity. Until I had visited the quarries, and seen just what they promised, I must admit having no idea of their extent. But no one can go into Pickens County and give close attention to the development there without being convinced that not the half has been told about the possibilities which the marble deposits hold out. I found that the Georgia Marble Company had settled right down to work. They have acquired, either by purchase or a ninety-nine years' lease, about seven thousand acres of the choicest marble land in the country, and they are making preparations to develop it in a most generous manner. Already they have constructed two and a half miles of a narrow-gauge road which connects at Tate Station with the Marietta and North Georgia Railroad. By the first of June they expect to have facilities to quarry daily ten to fifteen carloads of marble. While they have cutting and polishing works of their own, the bulk of the marble which they quarry will be taken by the American Marble Company, which is completing cutting and polishing works at Marietta that will enable the company to handle and ship about fifteen car-loads of marble a day. This company has control of a patent machine which enables it to handle the marble much cheaper and to much better advantage than by any of the old methods, and when completed the plant will be the most complete of its kind in the country. There is every evidence of business prosperity around Marietta.—*Correspondence Chicago Inter-Ocean.*

FIRE-RESISTING PROPERTIES OF CYANITE.—Some interesting tests of the fire-resisting properties of cyanite were afforded by the manufacturers of the material (the Patent Liquid Fire-proof Cyanite Company, Limited) on Wednesday last, on the site of the abandoned Opera-House, Victoria Embankment. The material is a liquid solution, of which silica is the basis, and it is applied with a brush directly to the surface of the wood-work, serving either as a priming to be afterwards covered with paint, or as a stain in lieu of the ordinary pale oak stain, which it much resembles in color when applied to deal or other white woods, though it is also made colorless. It is claimed by the manufacturers that this solution sinks into the pores of the wood, and renders the timber for a considerable period proof against the attacks of fire. That the application of the solution has the effect of retarding the attacks of the flames for a long time was conclusively shown by the tests of Wednesday last. The tests were four in number. For the first one a small flight of stairs, constructed of one-and-one-half-inch common white pine, was primed with two coats of cyanite, and underneath it a large heap of chips and shavings, plentifully besprinkled with benzoline, was ignited and burned for half an hour before the soffits of the treads and the backs of the risers were perceptibly charred. After the lapse of another half-hour, during which the under part of the wood-work of the stairs continued to smoulder, the stairs were proved to be strong enough to bear the weight of a man. Other tests, with packing-cases, were equally successful. The cases (three in number) were each about 2 feet 6 inches deep, 3 feet 6 inches long, and 2 feet 6 inches broad. They were each stood up on end, and a large fire of shavings and chips sprinkled with benzoline was lighted in each. One of the cases was not coated with cyanite, and it speedily collapsed and became a mass of charred embers. The two other cases retained their form and position after the lapse of an hour, and it was only after the first half-hour's exposure to the flames that the wood became perceptibly charred and began to burn to any appreciable extent. It is asserted that this solution is permanent in effect and does not injuriously affect the wood-work to which it may be applied. If this be so, the solution has a wide field of usefulness open to it.—*The Builder.*

ELECTRIC-LIGHT TIME TEST.—When the Franklin Institute held its Electrical Exhibition the various electric-light companies that had gone to the expense of preparing exhibits were promised in return that the Institute would hold a practical electric-light life test, to last one thousand hours, to decide which light was really the best. True to this pledge, the Institute began the duration test on April 11. Four companies, the Edison, the Weston, the Stanley, and the Woodhouse and Rawson, competed. The Sawyer, Mann, and Brush-Swan companies declined to participate. Extraordinary precautions were taken to prevent access to the lamps except by members of the Test Committee. Photometric tests were made at intervals. The results will shortly be published to the scientific world by the Institute. Yesterday morning the test had reached its 1,061th hour, and closed at 11:35 o'clock. The Edison Company, who entered twenty-one lamps, had lost one. They used the natural fibre bamboo carbon. The United States Weston Company, who entered twenty-four, lost seventeen, the artificial tamidene carbon being used. The Stanley Company lost nineteen out of twenty-two, and the English firm of Woodhouse & Rawson lost eleven, or their whole number entered. The result is a great victory for the Edison Company, as there has been much rivalry between the various corporations as to the merits of their lights. The Institute spent $10,000 on the test. A test of dynamos is now in progress and will be completed by the first of June.—*Philadelphia Bulletin.*

CLARK'S FLOATING BREAKWATER.—Mr. E. Hele Clark, of Starcross, Devonshire, shows models of a floating breakwater, the special application of which is in connection with the spreading of oil over the surface of waves, in order to check their violence. Mr. Clark's intention is to provide a means by which the floating breakwater itself is made to contain the oil, and to distribute it automatically, and further that the arrangement can be shifted without difficulty, so as to be moored in any desired position. By such means the removal of the cargo from a shipwrecked vessel may be facilitated, by anchoring the breakwater in such a position as to shield it from the force of the waves. The breakwater consists of a train of casks, or cylinders, connected to each other by ropes. Ballast is placed in each of the cylinders so as to load it to any desired flotation line, and the remaining space is filled with some absorbent material such as cotton waste. Oil is poured in until the waste is more than saturated, and holes are formed in the sides of the vessels above the water. This completes the apparatus, which certainly is of the simplest possible nature, and could be rigged up in extempore fashion at an hour's notice on any part of the coast. When placed in the water, the violent action of the waves forces the oil in sufficient quantities from the supersaturated waste, and it spreads in a calm-imparting film over the surface of the water.—*Engineering.*

A SHIP-RAILWAY IN THE PROVINCES.—The construction of a ship-railway to connect the Bay of Fundy with the Gulf of St. Lawrence has now been finally decided on. This will not exactly make Nova Scotia an island, but ships of one thousand tons and under will be able to reach St. John from Montreal, Quebec, and other ports on the St. Lawrence without having to encircle the dangerous Nova Scotia coast—a saving of six hundred miles. The ship-railway, which is to be seventeen miles long, will be supported by a subsidy of $30,000 a year for twenty years from the Canadian Government.—*Philadelphia Press.*

THE EFFECT OF TREE-PLANTING IN KANSAS.—In his Arbor Day proclamation the Governor of Kansas said that the State which the pioneers found treeless and a desert now bears upon its fertile bosom "more than 20,000,000 fruit trees, and more than 200,000 acres of forest trees, all planted by our own people." The Governor also says, "That there has been an increase in the rain-fall in Kansas is fully proved by the statistics of our oldest meteorologists."

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents herementioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

317,718. CHIMNEY-TOP AND VENTILATOR.—Gustav Burkhardt, Homer, Ill.

317,730. METHOD OF PRESERVING WOOD. — Edward Z. Collings, Camden, N. J., and Charles F. Pike, Philadelphia, Pa.

317,752. MACHINE FOR TESTING CEMENT.—Henry Faija, Westminster, County of Middlesex, England.

317,760. WOOD-WORKER'S BENCH-VISE. — Geo. W. and Charles A. Geissenhainer, Pittsburgh, Pa.

317,793. LAYING ARTIFICIAL STONE OR CONCRETE ARCHES.—Peter H. Jackson, San Francisco, Cal.

317,797-798. INSIDE BLIND.—Friedrich Keller, Milwaukee, Wis.

317,841. CORNICE-CUTTER.—Dudley Newton, Newport, R. I.

317,862. FIRE-ESCAPE. — Conrad Schrader and Friedrich W. Kitler, Milwaukee, Wis.

317,867. COPING.—Joseph F. Smith, Pittsburgh, Pa.

317,868. MANUFACTURE OF RIDGE-CAPS FOR CORRUGATED ROOFING.—John Smith, Kansas City, Mo.

317,885. PENDULUM-LEVEL. — William C. Thayer, Bainbridge, N. Y.

317,899. HOSE-TOWER AND FIRE-ESCAPE. — William M. Ward, Harbor Grace, N. F.

317,923-924. WRENCH. — Amos Call, Springfield, Mass.

317,926. WEATHER-STRIP.—Simon Chaffin, Sedalia, Mo.

317,931. FIRE-ALARM.—Gustave J. Crikelair, New York, N. Y.

317,940. APPARATUS FOR HEATING WATER IN BATH-TUBS.—George Hayes, New York, N. Y.

317,941. MORTISE-LOCK. — Frank A. Hollenbeck, Syracuse, N. Y.

317,943. ILLUMINATING - TILE CONSTRUCTION. — Thaddeus Hyatt, Brooklyn, N. Y.

317,944. ILLUMINATING COMBINATION - TILE. — Thaddeus Hyatt, Brooklyn, N. Y.

317,915. CONCRETE LIGHT FOR BUILDINGS, AREAS, ETC.—Thaddeus Hyatt, Brooklyn, N. Y.

317,959. FLOORING-CLAMP. — Paschal J. Abbott, Dexter, Me.

317,973. CHIMNEY AND VENTILATOR-TOP.—Conrad H. Casselmann, Effingham, Ill.

318,054. MANUFACTURE OF IMITATION - BRICK WEATHER - BOARDING. — Peter Toglio, Charleston, S. C.

318,083. SELF-CLOSING COCK FOR WATER-PIPES.—James M. Brennan, Elkhart, Ind.

318,084. STEAM-HEATING APPARATUS.—Henry W Brinckerhoff, Brooklyn, N. Y.

318,086. FIRE-ESCAPE TOWER. — Christopher Clarke, Northampton, Mass.

318,089. PIPE-WRENCH.—Frederick Crocker, Olean, N. Y.

318,099. PENDULUM-LEVEL. — Addison E. Gardner, Milan, Mich.

318,108. ADJUSTABLE CRESTING. — Christian Hanika, Springfield, O.

318,109. SHUTTER-WORKER. — James Hargraves, Providence, R. I.

318,125. DOOR-HANGER. — David Manuel, Hyde Park, Mass.

318,126. APPARATUS FOR SETTING ENCAUSTIC TILES, ETC.—Riverius Marsh, New Brunswick, N. J.

318,164. WINDOW. — William C. Bullivant, Boston, Mass.

318,183. SCHOOL DESK AND SEAT. — Gustavus Hamel, De Soto, Mo.

318,185. FLUID-EJECTOR FOR DRAINING CELLARS. —George Haydn, Baltimore, Md.

318,196. WALL AND CEILING OF BUILDINGS.—Lewis A. Mitchell, Elizabeth, N. J.

318,202. ELEVATOR ALARM-BELL.—Louis W. Pedicord, St. Joseph, Mo.

318,258. DOOR-CLOSER. — Mathew P. Ismay, Newcastle-upon-Tyne, England.

318,265. CONTINUOUS-ACTION KILN FOR BURNING BRICKS, ETC.—Henry Knowles, Woodville, County of Leicester, England.

318,280. SIDING-GUAGE. — Peter V. Moberg, Marinette, Wis.

318,293. FIRE-ESCAPE. — Henry Rensch, Quincy, Ill.

318,299. FIRE-ESCAPE. — Silvestre Sampre, New York, N. Y.

318,301. SAFETY-FLUE FOR CHIMNEYS. — Samuel W. Schnabel, Mayview, Mo.

318,319. DRAWING-BOARD AND DRAUGHTING-APPLIANCE.—Walter G. Stewart, Reading, Pa.

318,323. DOOR-CHECK. — William H. Teetzel, Detroit, Mich.

318,324. WALL FOR THE SUPPORT OF ARCHES AND BRICKS FOR THE CONSTRUCTION OF THE SAME.—Elah Terrell and William H. Fish, Columbus, O.

318,331. ADJUSTABLE - FACED PLANE. — Edwin Walker, Erie, Pa.

318,347. BRICK AND TILE MACHINE. — Albert L. Brewer and Hendrick Heesen, Tecumseh, Mich.

318,352. CAP AND ANCHOR FOR METALLIC ROOFING.—Benjamin F. Caldwell, Wheeling, W. Va.

318,373. ELEVATING MECHANISM FOR BUILDINGS. —William B. Hayden, Columbus, O.

318,388. LOCK.—Calvin W. Parsons, Scranton, Pa.

318,391. FIRE-ESCAPE. — William R. Price, Still Pond, Md.

318,401. STEAM-HEATING APPARATUS.—Frederick Tudor, Boston, Mass.

318,414. SHUTTER-FASTENER.—John A. Burr, New York, N. Y.

318,418. SPRING-HINGE. — Benoni Colvin and John Wolfley, Freeport, Ill.

318,421. SHUTTER-WORKER. — Russell G. Dudley, Jersey City, N. J.

318,437. WEATHER-STRIP. — John Trachsel, Jacob K. Lipps and William H. Turney, Columbia City, Ind.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS.—Since our last report thirty-two permits have been granted, the more important of which are the following:—

Dr. Wm. A. Moale, 4 two-st'y brick buildings, w s Division St., s of Dolphin St., and 4 two-st'y brick buildings, e s Brewer Alley, in rear.

J. W. Parks, 4 three-st'y brick buildings, commencing s w cor. Fort Ave. and Marshal St.

D. R. Miller, 2 three-st'y brick buildings, w s Tyson St., between Centre and Franklin Sts.

John Weitzel, 8 two-st'y brick buildings, w s Madeira Alley, s of Monument St.

Wm. McLaughlin, 8 two-st'y brick buildings, e s Little William St., n of Barney St., and 6 two-st'y brick buildings, n s Winder St., commencing n w cor. Johnson St.

Benj. B. Buck, 10 three-st'y brick buildings, n s Baltimore St., commencing n w cor. Gilman St.

R. & H. Laupheimer, three-st'y brick building, s s Gay St., between Aisquith and Forrest Sts.

J. S. Dyer, 5 two-st'y brick buildings, e s Scott St., s of Ramsay St.

J. & C. M. Stewart, 3 three-st'y brick buildings, s w s Myrtle Ave., n w intersection of Harlem Ave.

Wehr. Hobelman & Gottleib, three-st'y brick building, n s Conway St., e of Hanover St.

F. M. Woolf, three-st'y brick building, s s Baltimore St., between Carey and Calhoun Sts.

Boston.

BUILDING PERMITS. — *Wood.* — *Walk Hill St.*, near Blue Hill Ave., dwell., 20′ x 22′; owner, H. L. Atkinson; builder, J. J. Desmond.

Rockwell St., near Milton Ave., dwell., 24′ and 28′ x 30′; owner and builder, Thomas Pelton.

Vernon St., No. 142, cor. Linden Pl., dwell., 28′ 6″ and 29′ 6″ x 25′ 6″ and 33′ 3″; owners, N. C. & A. W. Morison; builder, N. C. Morrison.

H St., cor. East First St., manufactory, 40′ x 100′; owner, Suffolk M'f'g Co.

East Sixth St., No. 560, dwell., 22′ x 31′; owner, Julian A. Evans.

Quincy St., near Blue Hill Ave., stable, 24′ x 31′; owner, Frank M. Silva; builder, Manuel Silva.

Saratoga St., cor. Butler Ave., stable, 35′ x 58′; owner, Mrs. Harriet Burnett; builder, Wm. Messenger.

Cambridge St., near Saunders St., stable, 20′ x 30′; owner, J. F. Wadleigh.

Saratoga St., No. 793, stable, 20′ x 27′; owner, Mrs. M. Roby.

Brook Ave. Pl., near Brook Ave., dwell., 13′ and 22′ x 30′; owner and builder, J. Tucker.

Lexington St., No. 95, dwell., 21′ x 31′; owner, O. Lindergreen; builder, Garrett Dempsey.

East Fifth St., near H St., dwell., 20′ x 27′; owner and builder, E. M. White.

Brooklyn.

BUILDING PERMITS. — *Henry St., Nos.* 632-636, 139′ n Coles St., two-st'y church and Sunday-school, slate roof; cost, $16,000; Our Saviour's Norwegian Evangelical Church, New York, 56 Monroe St.; architect and builder, C. H. Griese.

Grand St., n e cor. Olive St., four st'y brick store and tenement, tin roof, iron cornice; cost, $10,000; owner and builder, Bernard Gallagher, 122 Union Ave.; architect, E. F. Gaylor.

Broadway, Nos. 619 *and* 621, e s, 34′ 4′ s Debevoise St., four-st'y brick store and dwell., tin roof; cost, $10,000; owner, Henry Meis, on premises; architect, Th. Engelhardt; builders, H. Eich & Bros.

Bedford Ave., s w cor. Lexington Ave., 3 four-st'y brick stores and flats, tin roofs, wooden cornices; cost, $7,000; owner, J. H. Ireland, Quincy St.; architect, I. D. Reynolds; builders, C. King and M. C. Ruch.

North Second St., n s, 150′ e Graham Ave., two-st'y brick dwell., tin roof; cost, $4,500; owner, Chas. Roemmelle, North Second St. and Graham Ave.; architect, J. Platte; builders, A. Frey and J. Rauth.

Park Ave., Nos. 747, n s, 200′ w Tompkins Ave., three-st'y brick tenement, tin roof, iron cornice; cost, $5,500; owner and contractor, Valentine Bruchhauser, 739 Park Ave.; architect, A. Herbert.

Raymond St., e s, 130′ s Willoughby St., rear, one-st'y brick cook and wash house, tin roof; cost, $5,000; owner, King's County; architect and builder, D. Ryan.

Sumner Ave., w s, 23′ n Quincy St., 6 two-st'y brown-stone dwells., tin roofs; cost, each, about $4,000; owner, architect and builder, D. S. Beasley, 39 Pulaski St.

Sumner Ave., n w cor. Quincy St., three-st'y brick store and dwell., tin roof; cost, $6,000; owner, architect and builder, same as last.

Stockton St., s w cor. Marcy Ave., 2 three-st'y frame stores and tenements, (brick-filled), tin roofs; cost, $4,000; owner, Wilhelmina Wills, 254 Humboldt St.; architect, H. Vollweiler; builder, Nicolaus.

Putnam Ave., n s, 39′ w Broadway, 2 three-st'y frame tenements, tin roofs; cost, $4,500; owner, D. W. La Fetra, 415 Putnam Ave.; builder, J. Brown; architect, R. Dixon.

Broadway, n w cor. Putnam Ave., three-st'y frame dwell., tin roof; cost, $5,000; owner, etc., same as last.

Broadway, w s, 53′ n Putnam Ave., three-st'y frame store and flat, tin roof; cost, $5,000; owner, architect and builder, same as last.

Putnam Ave., s s, 155′ e Tompkins Ave., 3 three-st'y brown-stone dwells., tin roofs; cost, each, $7,000; owner and builder, Chas. Isbill, 593 Herkimer St.

Halsey St., n s, 300′ w Reid Ave., 3 three-st'y brown-stone dwells., tin roofs; cost, each, $5,000; owner and builder, P. Ward, 723 Gates Ave.; architect, R. Dixon.

Greene Ave., s s, 428′ w Nostrand Ave., three-st'y brick and stone dwell.; cost, $10,000; owner, Rachel Armstrong, on premises; builder, G. F. Chapman.

Schermerhorn St., n s, 50′ e Court St., four-st'y brick tenement, tin roof; cost, $9,000; owner, James B. Healey, 205 Montague St.; architects and builders, O. K. Buckley & Son.

Washington Ave., Nos. 323 *and* 325, 2 three-and-a-half-st'y brown-stone dwells., tin roofs; cost, each, $8,000; owner, S. H. Cornell, 327 Washington Ave.; architect, A. Hill.

Gates Ave., s s, about 85′ w Franklin Ave., 6 three-st'y attic brick dwells., slate and tin roofs; cost, $55,000; owner, John Gibb, Broadway and Grand St., New York; architects, Parfitt Bros.; builders, Flynt Building and Construction Co.

North Ninth St., Nos. 142 *to* 146, s s, 125′ e Third St., 3 four-st'y frame dwells., tin roofs; cost, each, $5,500; owner, A. W. Schmidt, cor. North Ninth and Fourth Sts.; architect, Th. Engelhardt; builders, Joseph Wagner, Jr., and Jacob Armendinger.

Boerum St., Nos. 92 *and* 94, s s, 150′ w Ewen St., 2 three-st'y frame stores and tenements, tin roofs; cost, each, $1,200; owners, Josephine Cooper and Sophie Faust, on premises; architect, Th. Engelhardt; builders, J. J. Hoepfer & Son and John Fuchs.

Fulton St., s w cor. Rockaway Ave., 5 three-st'y brown-stone stores and dwells., felt, tin and gravel roofs; cost, each, $5,000; owner, Geo. R. Brown, 34 South Portland Ave.; builder, L. E. Brown.

Fulton St., Nos. 418 *and* 420, six-st'y Euclid Ohio stone and terra-cotta store and show-rooms, metal and slate roof; cost, $30,000; owner, W. C. Vosburgh M'f'g Co., Schermerhorn St.; architects, Parfitt Bros.; builders, James Ashfield & Son and P. F. O'Brien.

Fulton St., Nos. 414 *and* 416, six-st'y stone front store and show-rooms, metal and slate roof; cost, $25,000; owner, J. M. Horton Ice Cream Co.; architect and builder, same at last.

Hamilton Ave., south junction of Columbia St., two-st'y brick store and tenement, tin roof; cost, about $9,800; owner, Joseph J. Day, Jr., 19 Manhasset Pl.; architect, Samuel Curtin.

Montrose Ave., s s, 150′ e Humboldt St., three-st'y frame store and tenement, tin roof; cost, $4,200; owner, Jacob Jesberger, Montrose Ave.; architect, John Platte; builder, John Auer.

Lawton St., s s, 100′ w Bushwick Ave., Boulevard, three-st'y frame tenement, tin roof; cost, $3,500; owner, Henry Wills, Jefferson St.; architect, John Platte; builder, Henry Loeffler.

Fourth-street Basin, Gowanus Canal, s s, 280′ w Third Ave., one-st'y frame factory, gravel roof; cost, $4,800; owner, G. A. Reichardt, 15 Platt St., New York; architect and builder, D. E. Norris.

Seigel St., s s, 120′ w Humboldt St., three-st'y frame tenement, tin roof; cost, $1,400; owner and architect, F. R. Waellein, on premises; builder, J. Rueger.

Van Brunt St., e s, 80′ n Irving St., 3 four-st'y brick buildings, gravel roofs; cost, for all, $20,000; Marx & Rawolle, 163 William St., New York; architect, Thomas Gaunt; builders, P. J. Carlin and Long & Barnes.

Van Brunt St., e s, 40′ s Harrison St., two-st'y brick stable and dwell., felt and gravel roof, brick cornice; cost, $6,000; owner, architect and builder, same as last.

Van Brunt St., n e cor. Irving St., six-st'y brick building (for manufacturing purposes), cement and asphalt roof; cost, $79,000; owner, architect and builders, same as last.

Union St., s s, 290′ w Fifth Ave., 14 two-st'y brick dwells., tin roofs; cost, each, $5,000; owner and builder, C. Donnellon, 754 Union St.; architect, Robert Dixon.

Central Ave., n w cor. Suydam St., three-st'y frame store and tenement, tin roof; cost, $5,000; John Young, 785 Broadway; architect, Geo. Hillenbrand; builder, John Rueger.

Hamburg St., e s, 25′ s Melrose St., three-st'y frame store and tenement, tin roof; cost, $4,000; owner and mason, William Bayer, 69 Starr St.; architect, George Hillenbrand.

Hamburg St., s e cor. Melrose St., three-st'y frame store and tenement, tin roof; cost, $4,900; owner, mason and architect, same as last.

Macon St., s s, 40′ e Sumner Ave., 3 three-st'y brown-stone dwells., tin roofs; cost, each, $6,000; owner, etc., Wm. Zang, 98 Willoughby St.

Atlantic Ave., No. 501, n e, 150′ w Third Ave., five-st'y stores and tenements, tin roofs; cost, $15,000; Charles Werner and George Schnorr, 82 Schermerhorn St.; architect, Charles Werner; mason, J. F. Kelly; contractors, Martin & Lee.

York St., s s, 100′ e Adams St., five-st'y brick tin factory, tin roof; cost, $12,000; S. A. Isley & Co., on premises; architects, Eastman & Davis; builders; T. B. Rutan and E. Snediker.

Jefferson St., s s, 629′ e Throop Ave., 4 three-st'y brown-stone dwells., felt and gravel roofs; cost, each, $6,000; owner and architect, Wm. V. Studdiford, 82 Woodbull St.

Quincy St., n s, 467′ 8″ e Reid Ave., three-st'y brown-stone dwell., tin roof; cost, $4,800; A. S. Walsh, Madison St.; architect and builder, A. Miller.

Wythe Ave., e s, 30′ s Penn St., 2 three-st'y brick tenements, tin roofs; cost, each, $5,000; owner and builder, Peter Commerford, 67 Rodney St.; architect, I. D. Reynolds.

Wythe Ave., s e cor. Penn St., three-st'y brick store and tenement, tin roof; cost, $5,000; owner and builder, Peter Commerford, 67 Rodney St.; architect, I. D. Reynolds.

First St., n e cor. Seventh Ave., 6 three-st'y and basement brown-stone dwells., tin roofs; cost, each, $8,000; owners, etc., Martin & Lee, 410 Clermont Ave.

De Kalb Ave., n s, 150′ w Lewis Ave., 2 four-st'y brick stores and tenements, tin roofs; cost, each,

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$10,000; owner and mason, M. J. McLaughlin, 100 Kosciusko St.; architects, Hall & Newkirk.

Ellery St., n s, 150′ e Sumner Ave., two-st'y brick stores, tin roofs; cost, $4,500; August Grill, Jefferson St., near Bushwick Ave.; architect, John Platte; builder, John Rueger.

Bainbridge St., n s, 75′ w Reid Ave., 3 two-st'y brick dwells., tin roofs; cost, each, $4,000; Mrs. Kate Acor, 187 Bainbridge St.; architect, Amzi Hill.

Bushwick Ave., w s, 28′ s Troutman St., three-st'y frame store and tenement, tin roof; cost, $5,244; Johann Lange, 11 Stagg St.; architect, F. Holmberg; builders, John Rueger and Ernst Loerch.

Bushwick Ave., s w cor. Troutman St., three-st'y frame tenement, tin roof; cost, $5,400; owner, architect and builder, same as last.

Adams St., Nos. 77 and 79, 2 three-st'y frame tenements, tin roofs; cost for both, $10,101; George Koch, 79 Adams St.; architect, Frank Holmberg; builders, John Rueger and H. Bruchhauser.

Marcy Ave., w s, 50′ s Stockton St., 2 three-st'y frame tenements, tin roofs; cost, each, $4,000; Wilhelmina Will, 254 Humboldt St.; architect, H. Vollweiler; builder, Nicholaus Will.

Ellery St., n s, 375′ w Marcy Ave., three-st'y frame tenement, tin roof; cost, $3,400; owners and builders, Casp. Volhard and Chas. Reisler, 22 Union Ave.; architect, H. Vollweiler.

Norman Ave., n w. cor. Jewel St., 4 three-st'y frame store and tenement and tenements, cement and gravel roofs; cost, each, $3,500; owner, architect and contractor, David Atkin, 551 Lorimer St.; masons, Gatley & Smith.

Grand St., No. 166, s s, running through and including 169–177 South First St., two-st'y brick theatre, tin roof; cost, $17,000; Knapp, McCoard & Palmer, 94 Broad St., New York; architect, G. W. Wundrum; builders, Leahy & Moran.

South First St., Nos. 169–177, running through and including 166 Grand St., two-st'y brick theatre, tin roof; cost, $17,000; owners, architect and builders, same as last.

Ninth St., s w cor. Eighth Ave., 6 three-st'y and basement dwells., tin roofs; cost, one $8,000, and others, $6,000 each; Charles Long, 450 Ninth St.; builder, J. F. Wood.

Bedford Ave., No. 379, e s, abt. 250′ n Myrtle Ave., four-st'y brick tenement, tin roof; cost, $11,000; George Pfeiffer; builders, Jacob Rauth and —— McRush.

ALTERATIONS.—*Clinton Ave., No.* 353, three-st'y brick extension, tin roof; also interior alterations; also rear wall rebuilt; cost, $12,000: W. H. Nichols, on premises; architect, J. W. Romeyn; builder, P. J. Carlin; contractor, not selected.

Willoughby St., s e cor. Raymond St., interior alterations, etc.; cost, $27,000; owner, Kings County; architect, Daniel Ryan.

Chicago.

BUILDING PERMITS.—J. O'Malley, 7 three-st'y dwells., 199 to 209 Twenty-first St.; cost, $18,000; architect, J. J. Flanders.

Wm. M. Dale, 5 three-st'y dwells., 490 to 492 Madison St.; cost, $18,000; architect, Furst & Rudolph.

C. R. Dix, three-st'y dwell., 2220 Indiana Ave.; cost, $3,000; architects, Cobb & Frost.

Chicago Gas-Light and Coke Co., addition, Cologne and Deering Sts.; cost, $20,000.

(*Continued on page 3, Supplement.*)

PROPOSALS.

ARTESIAN WELL. [At Omaha, Neb.]

Sealed proposals for an artesian well of 1,000 feet, more or less, will be received at the Institute of the Deaf and Dumb at Omaha, Neb., **till July 10.**

For particulars address the superintendent. 494

FURNITURE. [At Cincinnati, O.]

OFFICE OF THE SECRETARY,
TREASURY DEPARTMENT,
WASHINGTON, D. C., May 29, 1885.

Sealed proposals will be received at this Department **until 2 o'clock, P. M., Monday, June 15, 1885,** for manufacturing and placing in position, in complete working order, furniture for the United States custom-house building at Cincinnati, O.

Drawings and specifications, with blank forms of proposals, can be obtained upon application to this office, where any further information may be had.

The Department reserves the right to reject any or all bids, and to waive defects.

Partial bids will not be considered.

Proposals should be addressed to the Secretary of the Treasury, and endorsed, "Proposals for Furniture for Custom-House, Cincinnati, O."

D. MANNING,
494 Secretary.

STONE AND BRICK WORK, FENCING AND GRADING FOR THE APPROACHES TO THE MARINE HOSPITAL BUILDINGS. [At Cairo, Ill.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., May 28, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 20th day of June, 1885,** for building the stone and brick work, fencing and grading required for the approaches to the Marine Hospital Building at Cairo, Ill., in accordance with drawing and specification, copies of which and any additional information may be had on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check for $200 for stone and brick work, $200 for fencing, and $300 for the grading, drawn to the order of the "Secretary of the Treasury," as a guaranty that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered.

M. E. BELL,
493 Supervising Architect.

ELECTRIC-LIGHTING. [At Traverse City, Mich.]

TRAVERSE CITY, MICH., April 29, 1885.

Sealed proposals will be received at Traverse City, Mich., by the Board of Commissioners of the Northern Asylum for the Insane, **until 10 A. M., of Wednesday, June 24, 1885,** at which time said proposals will be opened, for lighting the Northern Asylum for the Insane at Traverse City, Mich., by incandescent electric light, including dynamos, wiring, fixtures, engines, etc., all complete, excepting only the boilers, which will be furnished by the Asylum.

For information relative to conditions, plans, etc., see or address, C. M. WELLS.

By order of Board of Commissioners. 494

WAREHOUSE. [At Holyoke, Mass.]

HOLYOKE, MASS., May 25, 1885.

The trustees of the Whiting Street Estate invite sealed proposals for the building of a "Four-story warehouse and Office building" on Main Street in the city of Holyoke, Mass., according to plans and specifications prepared for the same by E. A. Ellsworth, Architect. Work to be divided and tenders to be submitted as follows: —

For brickwork and plastering.

For cut stone-work and setting the same.

For cast and wrought-iron work (columns and girders).

For carpenter work.

For slate and gravel roofing.

For painting and finishing.

Plans and specifications may be seen and all other information at the office of the architect.

Proposals will be received by the architect or trustees **until Wednesday, June 3, 1885, at 6 o'clock P. M.**

The trustees reserve the right to reject any or all bids, as may appear for the interest of the estate.

J. C. PARSONS,
493 For the Trustees.

BOILER-HOUSE. [Near Dayton, O.]

May 14, 1885.

Sealed proposals will be received at the Central Branch National Home for D. V. S., near Dayton, O., **until 2 o'clock, P. M., of the 16th day of June, 1885,** for supplying all materials and erecting at the Home a fire-proof steam-boiler house; size to be 90′ x 170′, with smoke-stack 150′ high.

Plans and specifications may be seen, on and after June 1, at the office of Peters & Burns, Architects, Dayton, O.

Bids must be made in round sums, and to include all branches of labor and materials, except the excavation for foundation, which will be done by the Home.

Only such bids as are herein called for will be considered, and all bids must be accompanied by certified checks, drawn to the order of the Treasurer, upon some National Bank, for five per cent of the amount of the proposal.

The Home reserves the right to reject any or all proposals, or to divide the contract between two or more bidders.

A sufficient bond will be required from the successful bidders, and in addition ten per cent of contract price will be retained from each payment until the contract shall have been completed.

Any additional information may be had on application at the office of the undersigned.

Envelopes containing proposals should be indorsed "Proposals for Building," and addressed to the undersigned. J. B. THOMAS, Treasurer.

P. O. Address, National Military Home, Ohio. 493

GRATES, MANTEL TILES, ETC. [At Memphis, Tenn.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., June 1, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 22d day of June, 1885,** for supplying and setting in place, complete, all the grates, mantel tiles, etc., required for the Custom-house and Post-office building at Memphis, Tenn., in accordance with the drawings, specification and schedule, copies of which and any additional information may be had on application at this office or the office of the Superintendent.

Bids must be accompanied by a certified check for $100, drawn to the order of "The Secretary of the Treasury," as a guarantee that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered. M. E. BELL,
493 Supervising Architect.

IRON ROOF. [At Quincy, Ill.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., June 2d, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 25th day of June, 1885,** for furnishing and putting in place, complete, the iron roof, framing, etc., for the post-office, court-house, etc., building, at Quincy, Ill., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check, (for $500) drawn to the order of "The Secretary of the Treasury," as a guarantee that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered. M. E. BELL,
494 Supervising Architect.

COUNTY BUILDINGS. [At Ellsworth, Me.]

May 20, 1885.

Notice is hereby given that bids will be received by the County Commissioners **till Monday, June 8, 1885, at 2 o'clock P. M.,** for the construction of a County Building, to include Court-room and County Offices, which construction shall include the grading of the lot and the furnishing of all materials for the substructure and the superstructure.

Bids will also be received up to the same day and hour for the re-building of the County Jail, and the County Commissioners reserve the right to reject any or all bids.

Plans and specifications can be seen at the office of H. B. Saunders, Clerk of Courts for the County of Hancock, where they may be examined by all who desire to present bids for the work.

The successful bidder will be required to furnish a good and sufficient bond for the faithful performance of the work.

Bids should be sent to H. B. Saunders, County Clerk, Ellsworth, Maine.

J. W. SOMES, N. B. COOLIDGE, J. W. BLAISDELL, — County Commissioners of Hancock County.

493

SOLDIERS' HEADSTONES. [At Hartford, Conn.]

STATE OF CONNECTICUT,
QUARTERMASTER GENERAL'S OFFICE,
HARTFORD, CONN., May 22, 1885.

Proposals will be received at this office **until 12 o'clock, noon, June 8, 1885,** for furnishing and erecting headstones for soldiers' graves.

The headstones are to be of the best quality of American white marble, each stone to be not less than five feet six inches long, one foot four inches wide, and four inches thick, and to stand two feet six inches above the ground. That portion of the stone which will be above ground when set (two feet six inches) to be sand-rubbed. The top of the stone to be curved (convex).

Each stone to be inscribed with the name of the soldier; his rank, if other than a private; the company and regiment to which he belonged, and date of his death, all on one face.

The letters and figures of the inscription to be accurately spaced and designed, properly and tastefully arranged, and smoothly and carefully cut. The work on the stones to be neat and strictly workmanlike in all respects.

The stones to be erected in any cemetery in the State, as they may be ordered from time to time from this office.

Each bid must include the proper setting of the stone at the grave.

A satisfactory bond will be required of the successful bidder.

A sample headstone can be seen and any further information required can be obtained at this office.

All bids should be addressed to

BRIG.-GEN. A. L. GOODRICH,
493 Quartermaster-Gen., Hartford, Conn.

WROUGHT-IRON PIPES. [Near Dayton, O.]

May 15, 1885.

Sealed proposals will be received at the Central Branch National Home for D. V. S., near Dayton, O., **until 2 o'clock, P. M., of the 16th day of June, 1885,** for supplying and delivering at the Home the following materials, as ordered, before December 1, 1885, viz.: —

Twenty-six thousand feet, more or less, lap-welded wrought-iron pipe; sizes, ½ to 6 inches.

Brass-mounted I. B., double-gate valves, screw-ends and wheels (for water): six 6-inch, six 4-inch, twelve 2½-inch, and twenty-four 2-inch.

Brass-mounted iron globe valves, without yoke, brass stems and screw-ends (for steam): six 4-inch, twelve 3-inch, twelve 2½-inch, and twenty-four 2-inch.

Iron cocks (square heads): three 4-inch, six 3-inch, six 2½-inch, and twelve 2-inch.

Light brass gas-cocks: twelve 1½-inch, twelve 1¼-inch, twenty-four 1-inch, and twenty-four ¾-inch.

Cast-iron elbows: one 8-inch, twelve 5-inch, sixty 4-inch, sixty 3-inch, forty 2½-inch, eighty 2-inch, fifty 1½-inch, fifty 1¼-inch, fifty 1-inch, and fifty ¾-inch.

Cast-iron elbows, 45°: fifty 1-inch, and fifty ¾-inch.

Cast iron elbows, easy bends (for water): twenty-four 6-inch.

Cast-iron plugs: six 6-inch, six 5-inch, six 4-inch, twenty 3-inch, twenty 2½-inch, thirty 2-inch, fifty 1½-inch, fifty 1¼-inch, fifty one-inch, fifty ¾-inch, fifty ½-inch, and fifty ⅜-inch.

Cast-iron tees: six 6″ x 4″, twenty-four 6″ x 3″, twenty-four 6″ x 2″, six 5″ x 3″, twelve 4″ x 3″, twenty-four 4″ x 2″, twelve 4″ x 1½″, twelve 3″ x 2″, twelve 3″ x 1½″, twelve 2½″ x 1″, twelve 2″ x 1¼″, twenty-four 2″ x 1″, fifty 1½″ x 1″, and fifty 1¼″ x 1″.

Cast-iron tees, easy bend (for water): six 6-inch and one 6-inch 8-inch outlet.

Cast-iron lateral branch Y's: twelve 2½″ x 1″, and twenty-four 2″ x 1″.

Cast-iron flange unions: six 6-inch, six 5-inch, twelve 4-inch, twenty-four 3-inch, twenty-four 2½-inch, and forty-eight 2-inch.

Malleable iron unions; fifty 2-inch, fifty 1½-inch, fifty 1¼-inch, and fifty 1-inch.

The Home reserves the right to reject any or all proposals, or to divide the contract between two or more bidders.

A sufficient bond will be required from the successful bidders, and in addition ten per cent of contract price will be retained from each payment until the contract shall have been completed.

Envelopes containing proposals should be indorsed "Proposals for Iron Pipe, etc.," and addressed to the undersigned. J. B. THOMAS,
Treasurer.

P. O. Address, National Military Home, Ohio. 493

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS.

NEW YORK has somewhat improved upon the example set by Boston in the formation of an organized body for constructing wholesome and decent habitations for the very poor. The Boston association proposes to build houses on the best possible plan, and rent them at reasonable rates, with the expectation of securing a good income on the investment, but of dividing only six per cent among the stockholders, and retaining the surplus, if there should be any, as a reserve fund for further charitable objects. This plan has much to recommend it, and as there are thousands of persons in all parts of the Union who would be glad to make sure of six per cent interest of money invested in such a safe sort of property as tenement-houses under good management, without pretending to any benevolent sentiments, there should not be much difficulty in propagating this form of charity very extensively. The New York Tenement-House Building Company, which has undertaken in that city to begin a similar work, proposes to limit the dividends paid to stockholders in the company to four per cent, reserving the surplus as a fund for the benefit of the tenants of the houses built by the company, who are to share in it in proportion to the amount of rent which they may have paid. This novel sort of participation in profits is probably intended to give the company a control over its tenants, by interesting them in retaining their rooms as long as possible, and avoiding such misconduct or delinquency as would lead to their expulsion, which, we suppose, will involve a forfeiture of their rights in the reserve fund; but it may easily afford a sort of life-insurance for the well-behaved tenants, which will save their families much hardship and distress. Advantage is also taken of the New York law which was made to facilitate the multiple ownership of real estate in the so-called "Home Club" apartment-houses, to promise to tenants of the new company the privilege of converting their interest in the reserve fund into stock of the company, a certain amount of which, as in the "Home Clubs," will entitle the possessor to the absolute ownership of a tenement corresponding in value with the amount of his stock. The Home Club method is for the owners of apartments to place their stock in the hands of trustees, who issue to them leases of their apartments, under such restrictions as the owners collectively see fit to impose upon themselves; and the same system, applied to tenement-houses of a lower grade, will secure the compliance, even of the stockholders, with the regulations of the house; while the tenement, or the stock representing it, forms just as good a piece of property as a house with four outside walls, and the owner, or his heirs, can live in it rent free, or may sell it, or let it to other persons and derive an income from it. The first operations of the company will be confined to the worst quarter of the city, in the neighborhood of the Tombs prison, where the poorest and filthiest people in New York congregate, in dens which have no parallel elsewhere in this country; and it is intended to provide for these people rooms in which they can live without danger from any filth which they do not themselves bring into them, and without paying more for rent than would be asked in the noisome hives which occupy the rest of the district. There is no question that such charity is more needed in this region than anywhere else in New York, but the company will find its task there a hard one, and if it can, even after years of effort, show half a dozen large tenement-houses filled with clean, orderly and prudent Polish Jews and Italian rag-pickers, it will certainly deserve and receive the congratulations of the charitable world.

A STRIKE is now in progress in the iron region of Ohio and Western Pennsylvania which, although it has thrown more than a hundred thousand men out of employment, seems to have had no very obvious pretext. In fact, so little understood is the movement that several theories have been put forward to account for it. the most interesting, though not perhaps the most probable, being that the strike is ordered for the purpose of forcing the manufacturers of steel nails in this country to abandon their business, on the ground that by the substitution of steel, rolled direct from the cast ingot, in place of the hand-worked wrought-iron nail-plates, a large number of puddlers and other workmen skilled in preparing wrought-iron will be thrown out of employment. A strike against the use of steel nails would now be about as likely to succeed as one against the rotation of the earth, and more reason is to be found in the complaint put forward by the officers of the Amalgamated Association of Iron and Steel Workers, that notice had been given of a reduction of twenty-five per cent in the wages of a certain class of workmen. Even if this reduction were more general than seems to be intended, the disposition, both of masters and men, in the iron trade seems of late years to incline toward the reasonable adjustment of wages according to the state of the market, of which both parties can judge; and as no attempt appears to have been made to settle the present difficulty by arbitration or conference, there is, perhaps, a little truth in the suggestion that the officers of the Amalgamated Association, finding their authority greatly diminished since the last great strike, have seized upon the first pretext for bringing on another general battle, knowing that, if victorious, they will regain a supremacy over their associates more complete than ever, and preferring, for the chance of this, to risk the complete disorganization of their association, which would probably follow a disastrous defeat. Small as the prospect of success in such an undertaking appears, the leaders probably count for help upon the effect which the enforced curtailment of production would have upon the iron market. A hundred thousand men can make a great deal of iron in a day, and considering that the consumption of iron, notwithstanding all the complaints of over-production, is reckoned by millions of tons, it is by no means unreasonable to suppose that a general cessation of production, even for a few weeks, might result in the prospect of a scarcity of iron, which would advance the price, and with higher prices for their product the manufacturers would be glad to restore wages to the point insisted upon by the officers of the Association, who would thus secure a victory, the effect of which would last long enough to serve their purposes, although, so far as the workmen are concerned, it is very doubtful whether wages could be maintained long enough to reimburse them for the millions of dollars of losses which they will incur by the strike.

A NEW element has also entered into the contest, which seems likely, unless the officers of the Amalgamated Association can devise means for lessening its effect, to interfere seriously with the success of any plans for controlling the iron market by strikes. A few of the larger mills in each district promptly acceded to the demands of the Association, and signed a scale of wages providing for about ten per cent reduction in place of twenty-five. These mills, together with such as employ men not belonging to the Association, are now in full operation, and it is said that an agreement has been entered into by the masters under which orders coming to the mills now closed are executed at those which have signed the scale, for the account of the firm which originally received the order. Orders for iron are not plenty at present, and the mill-owners can by this arrangement keep their customers, and continue to sell iron at a price which the lessening of the supply probably renders more remunerative than it would otherwise be, at the same time that they gain leisure to make

repairs and improvements, and escape the most serious burden of dull times, that of keeping from one motive or another workmen, who cannot be profitably employed. If this sort of coöperation among the manufacturers, which is, after all, perfectly legitimate, should have its natural effect, the striking iron-workers have very little to hope for, and, although we sincerely wish that they could all be sure of employment for the rest of their lives at higher wages than they have ever yet dreamed of, the only way, so far as we can see, in which they are likely to reach that condition of prosperity is, first of all, to repossess themselves of the independence and self-reliance which it is so pleasant for men who dislike the labor of thinking to delegate to ambitious demagogues; and secondly, to set themselves more earnestly than ever to do their work well, and to live the quiet, prudent, industrious life which seldom fails in this country to bring its reward sooner or later.

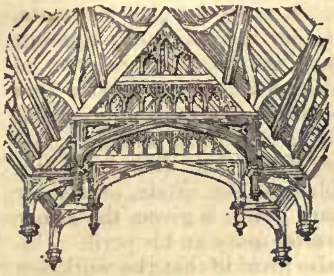
A VERY important law has just been passed by the Legislature of New York, and signed by the Governor, regulating the manner in which liens for work or materials shall be imposed and enforced in that State. The mechanics' lien laws in New York have been repeatedly changed within a few years, so that it has not always been easy for architects to follow them closely enough to protect their clients against their operation, and the new statute is so sweeping, and so well calculated to give trouble to owners of buildings, that it is particularly necessary for those who have to advise in regard to such matters to make themselves familiar with it. Unlike most lien laws, the New York statute gives those who furnish materials, as well as those who give only labor, "for buildings and other improvements" upon any estate, whether with or without the knowledge or consent of the owner, the right to advertise and sell the estate at auction, and pay themselves out of the proceeds for their goods, in case of failure of the person who actually bought them to meet his bills, classing them, for this purpose, with the poor mechanics whom the law allows, avowedly out of consideration for their necessities, and not for justice, to demand and receive from the owner of a building erected under contract the wages which the contractor may have failed to pay them out of the contract price which he has received. As enforced for the benefit of workmen, the operation of the law amounts simply to diverting by force the money of the presumably rich owner of the estate, to give it to the poor mechanics, with nothing but their daily wages to live on, who have been swindled out of them by a third person, whom the law confesses itself too feeble to catch; and it is rather creditable to human nature that such obviously unjust statutes should be submitted to, and even commended, by those who are most likely to be made the victims of them; but to extend to the dealers in materials, who are quite as likely to be able to bear the loss of their money as the average house-owner, and have all the opportunities for judging of the character and responsibility of the contractors who buy from them, and of recovering money due them, which other business men enjoy, that privilege of seizing the property of innocent third parties, and filling up vacancies in their own pockets with it, which has been given to mechanics in deference to their poverty, seems to us a perversion of the principle involved in such laws.

HOWEVER, the law-makers of New York having held a different view of the matter, their statute now provides that all persons, firms, associations or corporations who shall hereafter perform any labor or service, or furnish any materials which may have been used or are to be used in erecting, altering or repairing any house, bridge, wharf, building, pavement, fence, fountain, fruit or ornamental tree, shall be entitled at any time during the performance of the work or the furnishing of the materials, or within ninety days afterwards, to write in a book at the county clerk's office a notice that the estate is to be held liable for payment for the work or materials, whether these had been furnished by order or consent of the owner, or of any contractor or sub-contractor in an agreement to which the owner was a party; and at any time within a year after the filing of the notice the claimant may proceed to have the estate sold at auction by the sheriff for his benefit. So far, the law favors both workmen and "material men" much more strongly than most statutes of the kind, but as a compensation for this, it provides a rather novel, though only partial, protection for the owner, to the effect that if he shall refrain from overpaying a contractor, or mortgaging his estate, or otherwise endeavoring by collusion to favor the contractor, or escape his own duties, he shall not be liable to pay, on account of all the liens filed against his estate, a greater sum than the price stipulated in the contract, and remaining unpaid at the time the lien is filed; and all claimants under the law are obliged, within ten days after filing their liens, to post a notice of them in a conspicuous place on the estate, or deliver notice to the owner; and after such notice is given, the owner can make payments to the contractor only at his peril. Unfortunately, the statute does not also provide that the workmen and material men shall complete the building at the contract price, so that the owner is still liable to find himself left, after paying, perhaps, half the agreed sum to his contractor, and the other half on liens to the workmen and material men whom the contractor had failed to pay, with a partially completed building on his hands, which he must finish at his own expense in the best way he can. Of course, the only way to guard the owner against such mishaps is to insist upon making contracts by which a very large reserve is kept back out of the earlier payments to the contractor, the percentage of reserve gradually diminishing as the building approaches completion, and the amount which the owner would probably have to pay to get his house done after satisfying the liens on it grows less. We shall give the text of the statute in full later, and advise architects practising in New York State to make themselves familiar with it. For others this brief summary will perhaps be sufficient.

THE Trustees of Columbia College in New York have at last established the course of instruction in Sanitary Engineering, in connection with the School of Mines, which has been so long discussed. The time which has passed since the course was first proposed has been well employed, however, and arrangements seem to have been made for giving the best and most thorough instruction in the subject that the country can afford. The management of the course will be placed in the hands of Dr. John S. Billings, and we need hardly say that a better choice could not have been made. Dr. Billings will deliver lectures on hygiene, and instruction in the use of the microscope will be given by an assistant. The course will occupy four years, and graduates in it will receive the degree of Sanitary Engineer. If we are not mistaken, a gift or promise was made to the college some years ago of funds to establish systematic instruction in Sanitary Engineering, and it is gratifying to find that the Trustees have taken measures to make the course as thorough as the others in their renowned School of Mines.

LE GENIE CIVIL quotes from *La Nature* a description of an easy, and apparently effectual process for coating articles of iron with a shining black varnish, more adhesive and durable than any of the ordinary varnishes or japans now in use. No apparatus is needed for the process, which, by the way, is the invention of M. Puscher of Nuremberg, beyond an iron box in which is fitted a grating and a tight cover. The first thing to be done is to sprinkle the bottom of the box with powdered soft coal to a depth of about three-quarters of an inch; the objects to be coated are then placed on the grating, and the box is then covered and hermetically sealed, and placed over a fire. After the expulsion of whatever moisture there may be in the dust, the coal itself begins to decompose, and thick, tarry vapors are given off. The bottom of the box is kept at a dull red heat for about half an hour, after which the whole is removed from the fire and allowed to cool. On removing the cover the tar is found to have condensed on the surface of the iron objects in the box, forming a glossy coating, so flexible and adhesive that thin articles may be bent double without cracking it. Except for the danger of bursting the box, which might be considerable if the coal-dust were damp, or if air were allowed to mix with the gas in the box while it remained on the fire, there seems to be no difficulty about the process, and as coal-tar is known to penetrate to a certain extent into the pores of cast-iron even when applied in a liquid state, it is not impossible that when brought into contact with it in a condition of vapor it may attach itself to the metal even more thoroughly and permanently.

SOME CELEBRATED TIMBER ROOFS.[1] — II.



Eltham Palace Hall.

FRENCH architects and engineers in the sixteenth, seventeenth and eighteenth centuries occupied themselves a good deal with roofs with curved ribs, and two systems of constructing the rib were worked out. In the most modern of them, that invented by Colonel Emy, the ribs were constructed of a series of thicknesses of bent timber, one on the back of another, and held together by bolts. In the older system, that of Philibert Delorme, the ribs were also built up, but the pieces composing them are placed side by side, and either form a polygon approaching a semicircle, or are cut to bring them to a curve. In fact, the ribs are very much such as have been already described as used for the great dome of the French Corn Market.

There is, however, a great difference between a dome — the strongest of all forms and one permitting the introduction of as many rings of ties as may be desired — and a roof over an ordinary oblong space, where no such binding together is admissible, and where straight rafters may have to be used, which loads the rib at certain points only. In the latter case, a good many precautions have, generally speaking, to be taken to prevent the rib from being unequally loaded, and so either spreading or losing its shape in some other way. The rib made of unbent timbers side by side, on Delorme's plan, is admitted to be stronger than the one made of bent timbers laid one on the back of the other; but both have been largely used, and good examples of both may be met with, even if we confine ourselves to English ones alone, and leave the French ones unnoticed.

A very fine roof with ribs, one on which the load (though light) is borne without a rafter, solely by the rib, covers the great conservatory built by the Duke of Devonshire at Chatsworth. This building was rather notorious at the time of its erection, but has probably now passed out of the recollection of most people not familiar with Derbyshire. It consists of a wide and lofty central portion, with a kind of broad aisle at the sides, roofed at a lower level. The central roof here is of the section of a pointed arch and hipped at both ends, and is entirely covered with glass. It is carried by timber ribs, and the glazing is on the ridge-and-furrow principle. The low aisle referred to forms to some extent an abutment for the ribs, and the ridge-and-furrow glazing helps no doubt to fortify them, but still the greater part of the strength is derived from the ribs themselves. I had recently an opportunity of examining this building carefully, and though it does not appear to have been as well taken care of as one could wish, still the roof remains sound and the ribs appear true to their curve and in line with one another.

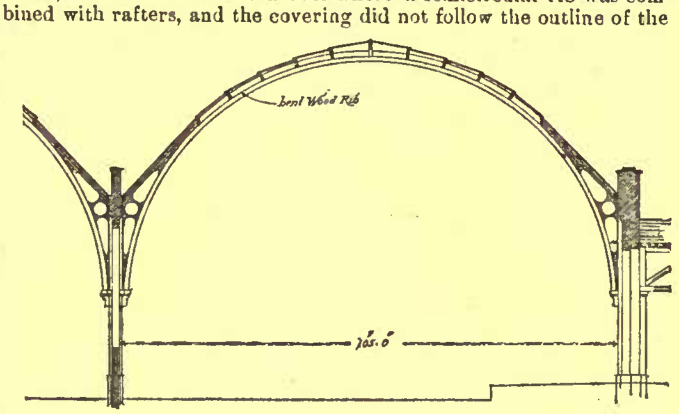
Another rib roof, and one which obtained a world-wide celebrity, was the roof over the nave of the Great Exhibition of 1851, reproduced in its main features in that of the nave and transepts of the Crystal Palace at Sydenham. Here, again, the load is a continuous one, the roof-covering being the same shape as the rib.

It was intended that the '51 Exhibition should have a flat roof over the nave, carried by long lattice girders, and it is understood that the merit of suggesting a semicircular roof instead belongs to Sir Charles Barry. The construction was no doubt designed by Sir Charles Fox, who made the working-drawings of the entire building with his own hands. The span of this roof was seventy-two feet; the principals were twenty-four feet apart from centre to centre; they consisted of timber ribs measuring seventeen and one-half inches deep and eleven inches wide at the back, and eight inches in width in the main part of the rib, and formed of no fewer than eleven pieces of timber bolted together. This construction combined the two systems of rib-building described. These ribs appear to have stood well, as have the ribs of the Crystal Palace roof.

For the Exhibition of 1862, at South Kensington, a somewhat more solid building was designed by Captain Fowke. It had a nave with a semicircular rib, but had also a rafter, so that the covering did not follow the outline of the rib. The span was greater than at the Crystal Palace, being eighty-five feet against seventy-two feet; the depth of the rib was one-half inch more, being increased to eighteen inches, and the width of it was ten inches. It was made of six pieces only, and was entirely on the older or Delorme's construction. The distance apart was increased to twenty-five feet. This roof was, I believe, re-erected at the Alexandria Palace, and was destroyed in the great fire at that building. In the '62 Exhibition many annexes were built, with ribs having a span of fifty feet, and a distance apart of fifteen feet. The ribs were three inches by nine inches, and these roofs failed seriously by spreading.

In the great buildings occupying the same site, and covering many acres of ground, which were erected for the Fisheries Exhibition and added to for the Health Exhibition, many acres of roofing were put up by the late General Scott, of which the wider spans recalled to some extent the annexes already alluded to. These are, however, a little stronger in various respects, and they appear to have answered the expectations of those who designed them. The span of these roofs is a little less, and the principals are considerably nearer together, than in the roofs which failed in 1862. The span is forty-eight feet. The polygonal rib (which is virtually semicircular) springs ten feet from the floor. The sides of the building continue to a height of twenty-seven feet six inches from the floor, or twenty-eight feet from the ground, and the ridge is forty feet from the ground. This rib is two and three-fourths inches thick by about ten inches average depth, and is in three thicknesses, made up of deals: a middle one and one-fourth inches thick by nine inches, and two three-fourths inches by nine inches at the sides. The pieces of which the rib is composed are six feet long. At every six feet there occurs a radiating brace, nine inches by one and three-eighths inches, pointing to the centre of the arch. Each brace is worked into the substance of the rib, and seems to connect it to the uprights of the side framing or the rafters, as the case may be. The ribs are ten feet apart, and the boarding is carried by small rafters, six inches by two inches, laid purlinwise on the back of the principal rafter belonging to the truss. This is probably as slight a construction as has ever been successfully employed.

This series of roofs may be closed by a reference to a roof with timber ribs on Colonel Emy's plan that has failed. I refer to the roof put up at the terminus of the Great Northern Railway, King's-Cross, in 1852. This was a roof where a semicircular rib was combined with rafters, and the covering did not follow the outline of the



Northern Terminus, King's-Cross, London.

rib. The spans were each one hundred and five feet, the ribs were twenty feet apart, and each rib is stated to have consisted partly of eight and partly of sixteen one-and-one-half-inch bent boards, screwed and bolted together. The trusses soon after being fixed showed signs of spreading, and were buttressed at the feet. The ribs became distorted in shape, being perceptibly flattened at the top, and after remaining in that condition for a good while (probably about twenty years), the ribs of one of the two spans have been replaced by trusses with a wrought-iron semicircular rib. This experience seems to tell decisively against the use of ribs made on Colonel Emy's plan of bent timber, for they were employed here under conditions on the whole very favorable.

The roofs with oblique ties, like Westminster Abbey or the Rouen Hall, and those with curved ribs, like the Crystal Palace or the Health Exhibition, by no means exhaust the list of roofs without tie-beams. Another method of dealing with the same problem was worked out towards the close of the period which we call the Middle Ages, and, as it resulted in the most splendid and most thoroughly architectural roofs that we have to consider, I have left it to the last.

The earlier stages of the growth I am about to describe may be illustrated from church roofs; the concluding and most complete was employed chiefly for the roofs of halls much wider than the nave of an ordinary church, and it is from such halls that we shall get our best examples. Let us go back to church roofs, as they were executed at the middle of the fourteenth century.

The walls in common use were very thick, and as the gutter was usually an eaves gutter, it became customary to carry the rafters to the exterior, and to frame them into a short horizontal timber, which

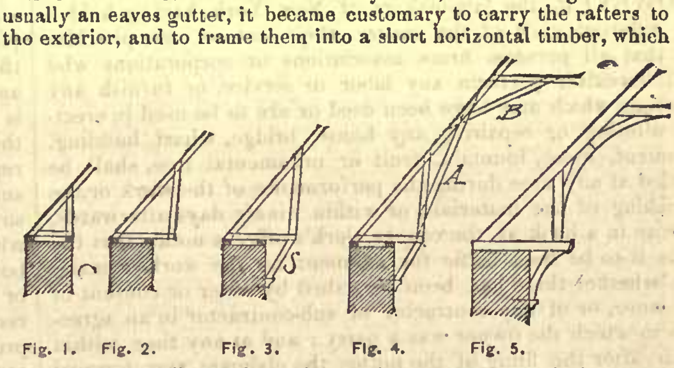


Fig. 1. Fig. 2. Fig. 3. Fig. 4. Fig. 5.

lay across the wall, and from that timber to carry up a little post or prop flush with the inner face of the wall, to support the rafter near its foot (see Fig. 1). The idea suggests itself that by prolonging this short horizontal timber, usually called the wall-piece, the prop assisting the principal rafter might reach it more nearly at the point where

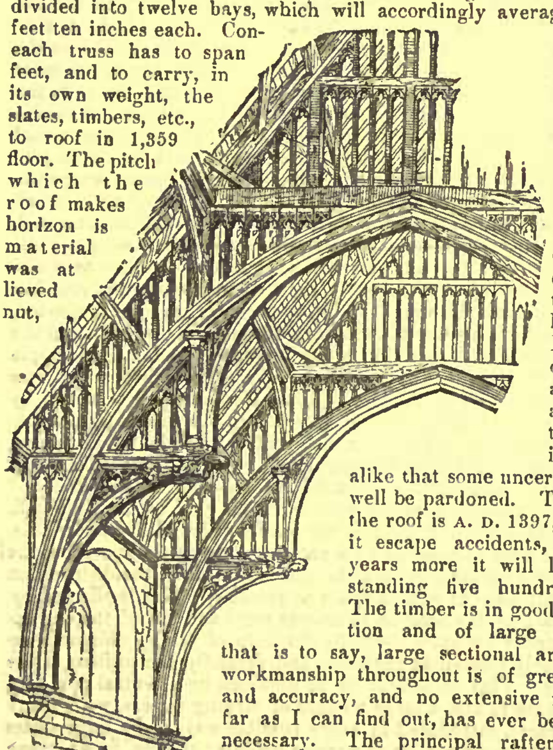
[1] A lecture by Professor T. Roger Smith, delivered at Carpenter's Hall on Wednesday evening, April 1st, being the last of the present series of "Free Lectures to Artisans on Matters connected with Building," given under the auspices of the Carpenter's Company, and published in the *Builder*, the illustrations being added by the *American Architect*. Continued from page 261, No. 492.

its aid was needed (see Fig. 2) It will be seen at a glance that the wall-piece here acts as a lever, of which the inner edge of the wall is the fulcrum. The weight of the rafter presses on the long arm, and the short one is accordingly extremely strong, and affords nearly as good a support for the upright post as though it rested on the wall itself. By degrees this wall-piece was pushed out more boldly, and it soon was felt that a strut, S, from the wall below (see Fig. 3) would give some additional strength, and would also satisfy the eye by preventing the rather unsightly overhanging horizontal piece from appearing to have nothing to carry it. So the strut was introduced, and in church roofs it became usual to curve or mould it, so as to make it a better architectural feature. The next step was to carry up from this same point a second strut, A (see Fig. 4), to a point farther up the rafter, and afterwards a tie was sometimes added at B, to give a hold on the collar-beam or tie-beam, whichever we call it, above. In roofs having any pretension to artistic treatment, the inner faces of these struts and ties were cut to curves. (See Fig. 5.)

This combination of struts, horizontal piece and posts is to be met with in many great roofs which were successfully framed in England, and a system somewhat similar, though not identical, was pursued in France. In the English examples the elongated wall-piece is called a hammer-beam. The horizontal tie or collar beam is generally about half-way up the rafter, and the lower half of the rafter is fortified by support derived from the hammer-beam, through the post and strut rising from it; the hammer-beam itself being in turn supported by a strut from a corbel built into the wall.

The finest and almost the earliest example of a hammer-beam roof, and no doubt the finest timber roof in the world, is the roof over Westminster Hall, which I will now proceed to describe.

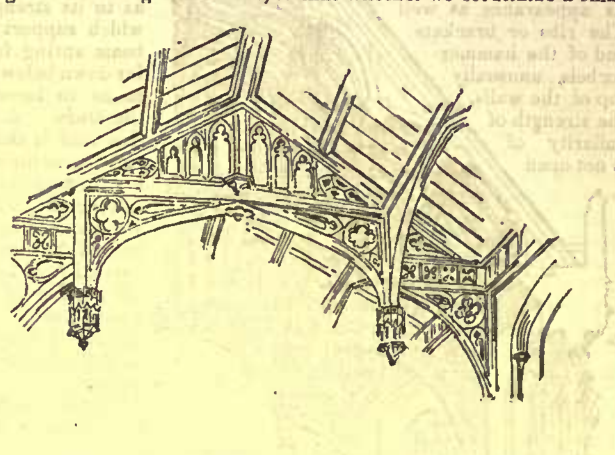
Westminster Hall is sixty-eight feet wide between the walls, and two hundred and thirty-eight feet long. It is forty-two feet high to the top of the walls, and ninety feet to the ridge of the roof. It is divided into twelve bays, which will accordingly average nineteen feet ten inches each. Consequently each truss has to span sixty-eight feet, and to carry, in addition to its own weight, the weight of slates, timbers, etc., necessary to roof in 1,359 feet of floor. The pitch or angle which the slope of the roof makes with the horizon is 52°. The material employed was at one time believed to be chestnut, but is really English oak. The appearance of the two woods is so much alike that some uncertainty may well be pardoned. The date of the roof is A. D. 1397, so that, if it escape accidents, in twelve years more it will have been standing five hundred years. The timber is in good preservation and of large scantling; that is to say, large sectional area. The workmanship throughout is of great beauty and accuracy, and no extensive repair, so far as I can find out, has ever been found necessary. The principal rafter of each truss is of considerable strength. The collar is placed just half-way up the rafter. The hammer-beams receive the foot of the rafters at their extremity, and each projects rather more than a quarter of the span from the wall, and has its end beautifully carved with the figure of an angel carrying a crown. A strong post is carried up from the end of the hammer-beam to the point where the collar and the principal rafters join. A timber, which may be called a wall-post, rises from a corbel far down the wall, and supports the under side of the hammer-beam at the point where it leaves the wall, and a second post vertically above this supports the principal rafter. There is a strong and richly-moulded rib which acts as a bracket or strut, springing from the corbel just referred to, and framed into the hammer-beam near its free end. A second similar rib, rising from the hammer-beam, supports the middle of the collar. All these pieces, except the principal rafter, are knit together by a magnificent arched rib springing from the corbel from which the lowest carved rib starts, and framed to the hammer-beam, the post on the back of that beam, the collar, and both the curved ribs. Above the collar a second collar is introduced, and a post connecting the two is added, while at the middle of the truss a central post, something like a short king-post occurs. Between all these timbers there is a kind of filling-in of mullions or small posts, the spaces between having ornaments at the heads. These, no doubt, perform quite as much the important structural duty of connecting every member of this great framework together, as they do the artistic duty of filling up the great outline with subordinate features which give scale to it, enable its vastness to be appreciated, and bring out the variety of its lines by their contrast with the uniformity of the filling-in.



Westminster Hall.

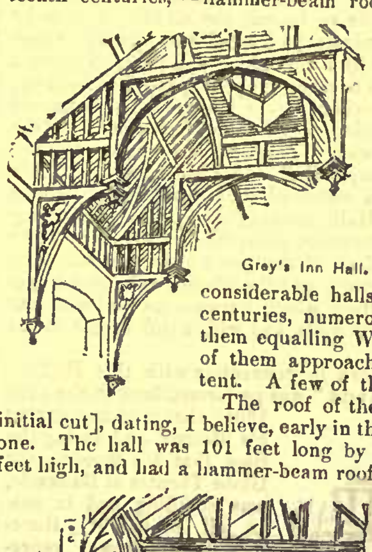
The usual longitudinal timbers, called purlins, running from truss to truss, are employed here, and furnish support to the roof rafters. The purlins are themselves supported lengthways from the great trusses by braces. The middle purlin is supported by a beautiful arched rib springing from the post on the hammer-beam. The upper purlin has a curved brace springing from the principal rafter. The lower purlin has a curved brace springing from the back of the great curved rib. Below this purlin occur the openings in the roof covering, which correspond with the great dormer windows, from which the hall receives a considerable portion of its light, but which are said not to have been part of the original design.

I have already mentioned the fineness of the workmanship; I need only add that every ornamental part is equally well wrought, and is designed with the greatest skill, so that whether we scrutinize a small portion or endeavor to take in the impression to be produced by the whole, we are equally convinced that this is a masterpiece of architectural art as well as of the carpenter's skill.

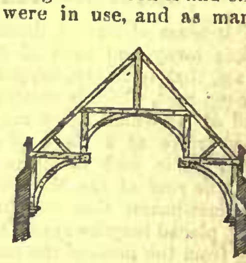


Christ Church, Oxford.

For about 200 years, — that is to say, during the fifteenth and sixteenth centuries, — hammer-beam roofs were in use, and as many considerable halls were built during those two centuries, numerous examples remain, none of them equalling Westminster Hall, though many of them approaching it in beauty, if not in extent. A few of these I will name to you.

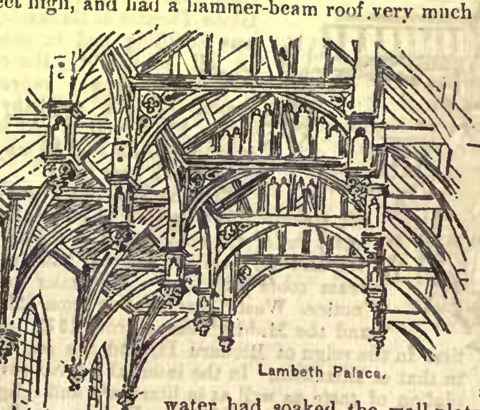


Grey's Inn Hall.



Westminster School.

The roof of the hall of Eltham Palace [See initial cut], dating, I believe, early in the fifteenth century, was a fine one. The hall was 101 feet long by 36 feet 3 inches wide, and 54 feet high, and had a hammer-beam roof very much like that at Westminster in design, but without the great rib, and rather less steep. This roof was of oak, and remarkable for the beauty of the workmanship and goodness of the material. This building has been allowed to fall into decay. Fifty-nine years ago Mr. Dunnage found that water had soaked the wall-plates, and they had decayed, and given way, occasioning the failure of the roof. Part of it is, however, still standing, but soon the whole will have disappeared.



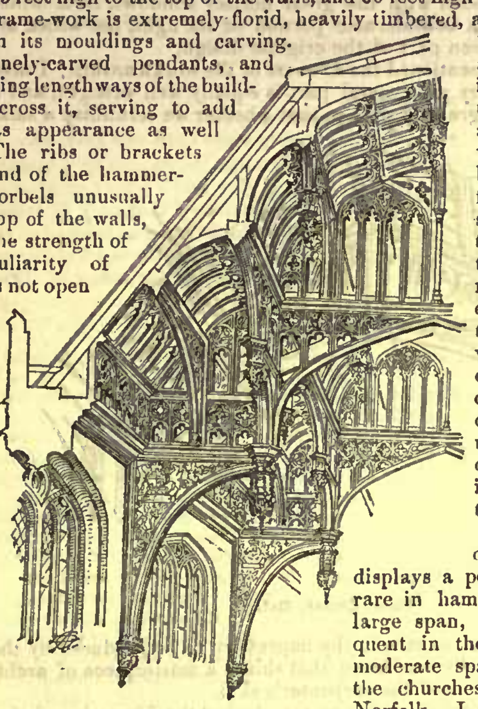
Lambeth Palace.

At Oxford, timber roofs of various degrees of beauty, but all belonging to this class of construction, occur in the halls of at least half a dozen colleges, namely, Corpus, University, Wadham, Jesus, Oriel, and Christ's Colleges; and in Cambridge in two or three such halls, as St. John's and Jesus Colleges. There is a plain roof of

this sort at Westminster School, one more ornamented at Gray's Inn Hall, and another at the Library at Lambeth Palace, an apartment of much dignity and beauty, 93 feet long, 38 feet wide, and 50 feet high.

Perhaps, however, the finest specimens after Westminster, certainly among the most ornate, are two that date from the sixteenth century, — the roof of Wolsey's Hall at Hampton Court Palace, completed about the year 1526, and that of the Middle Temple Hall, London, erected in 1572.

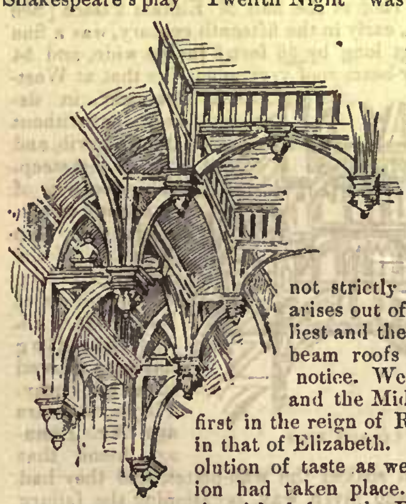
The hall at Hampton Court is 106 feet long by 40 feet wide, and 45 feet high to the top of the walls, and 60 feet high to the ridge. The frame-work is extremely florid, heavily timbered, and extremely rich in its mouldings and carving. There are some finely-carved pendants, and arched corbels running lengthways of the building as well as across it, serving to add to the richness of its appearance as well as to its strength. The ribs or brackets which support the end of the hammer-beam spring from corbels unusually far down below the top of the walls, so as to increase the strength of the truss. A peculiarity of this roof is that it is not open right up to the rafters through its entire height, but a wooden ceiling of curved-outline is carried so as to cut off portions of the upper part. The outline of this roof is also peculiar externally.



Hampton Court Palace.

The roof of Middle Temple Hall displays a peculiarity which is rare in hammer-beam roofs of large span, though not infrequent in the timber roofs of moderate span to be found in the churches of Suffolk and Norfolk. I allude to a double hammer-beam. Suppose the collar-beam of one of these roofs to be cut, the middle of it to be taken away, and each of its ends to be treated just like a hammer-beam, that is to say, supported by a curved rib and made to carry a second post, which is carried up to meet the principal rafter high up, and above which there may, perhaps, occur a short collar-beam, we now arrive at a piece of framing to be found frequently in the churches in such towns as Ipswich. This outline forms the basis of the fine roof of the Middle Temple Hall. In addition to its double hammer-beams this roof has a series of very conspicuous curved ribs, placed lengthways of the Hall, carrying the purlins and springing from the posts of the truss near the point whence the curved ribs of the truss itself rise. The foot of the posts is formed with rich bosses, from which the ribs spring, and the whole produces a singularly rich and well-combined effect, which harmonizes well with the panelled woodwork that lines the walls, and with a rich screen at the lower end of the Hall.

There is an interesting record in connection with this Hall, — Shakespeare's play "Twelfth Night" was performed here in the year 1601; that is to say, during his lifetime, and during the time that his theatre, the Globe Theatre at Bankside, was standing and in use. In all probability, therefore, the play was represented by his company, under his direction, and it is even possible that he may have taken part in it.



Middle Temple Hall.

One other observation not strictly belonging to carpentry arises out of the comparison of the earliest and the latest of the great hammer-beam roofs that have come under our notice. Westminster, dating from 1397 and the Middle Temple from 1572, the first in the reign of Richard II, and the second in that of Elizabeth. In the interval a great revolution of taste as well as in literature and religion had taken place. Modern Europe, as distinguished from the Europe of the Middle Ages, began in the sixteenth century, and the reformation of religion, the revival of Greek and Roman learning, the birth of the modern literature and fine art, and the return to Classical architecture, are all parts of the great change which took place at this time. The reign of Elizabeth is marked by an architecture of change. You all must have heard something about Elizabethan buildings. Their great interest lies in the fact that in them we can see the old Gothic architecture disappearing and the revived Classic advancing. The two are, indeed, blended in a manner which is at times most picturesque. The Middle Temple Hall is an example, and a very good one, of this style. The roof is still in its main lines allied to the Gothic roofs which went before it, but its ornaments and its mouldings are both of them different, and follow Italian models. Just the same thing may be traced in the roof of Lambeth Palace Library, and it is worth notice, — if for nothing else, — as an example of how the architecture of old buildings properly understood preserves to us visible and tangible records of the political and social history of our country. Such buildings continue to illustrate the past for centuries after the men who erected them, with their manners and customs, have passed away from the face of the earth.

I propose, in conclusion, to mention a few important modern English roofs belonging to recent buildings of Gothic design. I shall first refer to a tie-beam roof of fir, but one in which the general principles adhered to by the carpenters of the Middle Ages are followed, — I mean the roof on the great hall of the Law Courts. This roof is not what is commonly called an open roof, — that is to say, not a visible roof like that of Westminster Hall, as it covers a vault of masonry which forms the ceiling to the hall.

The span of this roof is considerable. The pitch, as will be apparent to any one who notices the gable of the Hall in passing up the Strand, is comparatively steep, and would have permitted the use of tiles. The truss is a king-post truss, but the principal rafters are each of them double, that is to say, the two usual principal rafters are framed, in the usual manner, into the beam and king-post, but, in addition, immediately within them, a kind of inner and additional principal rafter is employed. This method adds a good deal to the strength of the roof, and was not unfrequently resorted to by Mediæval carpenters.

Another peculiarity, which was my chief inducement to include the roof over the Law Courts, is the employment of a *flèche* or timber spire to ornament the building. This spire is carried on the ridge of the main roof. These timber spires are among the most difficult and intricate pieces of carpentry known, and, owing to the great height at which they commonly start, few persons recognize their great size and consequent weight. Nor is the weight of a roof spire the only, or even the most serious, strain that has to be provided for. Such a feature rises in the unsheltered region where the full force of every hurricane that blows is felt, with nothing to break the shock; and although such a spire is usually circular or octagonal, so that the wind has less purchase against it than if it were square, we must not forget that it is very tall, so that such pressure as is sustained is intensified at the foot of the structure where the roof has to support it. And this weight and wind-pressure has to be supported, not on any solid basis like the masonry of a church tower, but on the framework of a roof spanning a vacant space. A famous example of such a structure is the *flèche* at Amiens Cathedral, which was measured and drawn by the late William Burges, and was shown, by the courtesy of the Architectural Museum, in our recent Exhibition. Another well-known example is the timber spire in the Cathedral of Notre Dame, in Paris, reconstructed by M. Viollet-le-Duc, and fully described and illustrated in his "*Dictionary of Architecture*." Another, but smaller, example surmounts the roof of the Guildhall.

The details of the construction are hardly fit for a lecture like this, and can be best unravelled by a patient study on the spot; but the general principles involved may be said to be, first, the distribution of the weight over as wide a space as possible. This is effected by carrying part of the load on to trusses right and left of the one immediately under the spire itself, by the help of sundry oblique bearers, as strongly framed as possible; and, secondly, the *stiffness* of the actual spire. This is sought to be obtained by a central post running from base to top, a large number of sloping rafters, with many diagonal braces, introduced in every possible way, and a large series of horizontal ties or purlins at various heights; thirdly, by as strong a connection as possible between the spire and the base established on the trusses of the roof. A great many timbers are employed, put in various positions, so as to stay every point as much as possible, and the result seems to be that this lofty structure is perfectly secure.

The roof of Lincoln's Inn Hall, part of the new buildings erected by Mr. Hardwick in 1845, is a fine hammer-beam open roof. The hall is 120 feet long by 45 feet wide, and 64 feet high. The roof is framed of oak. Unfortunately I am not able to produce an illustration of it.

The great hall of the Manchester Assize Courts, a building erected from the designs of Mr. Waterhouse, has a fine open roof, of a construction which presents a somewhat unusual combination. The hall is 100 feet long, 48 feet 6 inches wide, and 75 feet high; it has seven timber hammer-beam trusses dividing the length into eight bays of the somewhat unusual extent of 25 feet each. The hammer-beam trusses do not, however, carry the whole weight of the superstructure, as is the case with every other roof with which we have dealt; two trussed purlins, or, more properly, latticed timber trusses, 16 feet 6 inches deep, run, in lieu of two of the purlins, from end to end of the hall and bear on the gable walls. These are, of course, framed to each hammer-beam truss, but, being of themselves of considerable strength, they do a large part of the work; and, indeed, I gather from the architect's own published account of this roof that, in his opinion, the chief duty is thrown upon them. They, he says, support the upper part of the roof, while the wall-brackets, which form the lower part of each hammer-beam truss, are needed chiefly to

steady them. The architectural effect of this roof is excellent, and I dare say some of those present have seen it.

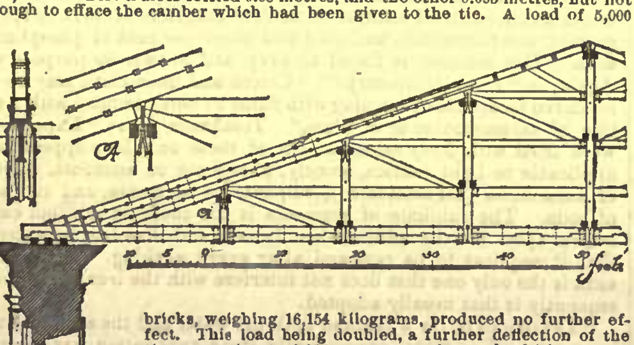
The last modern timber roof which I shall refer to is the roof over the Guildhall, London, erected a few years ago from the designs of the City Architect, Mr. Horace Jones, whose fine roof over the new Council Chamber, in which, however, the main framework is iron carrying a timber ceiling, is also illustrated by some of the drawings on the walls. Guildhall is 159 feet long. Its width is not perfectly uniform, but the average is 49 feet 6 inches; it is 80 feet high. The roof is constructed, as every roof which is to form part of a public building of the first importance should be, of oak. Practical carpenters will be the first to appreciate the increased strength and solidity and the greater tenacity of the joints, and the freedom from the risk of their crushing in, which the use of oak secures, as compared with deal, or even pitch pine.

In the Guildhall roof there are seven principals, and therefore eight bays of about 19 feet each. The collar of this roof is 29 feet long, and it was cut out of timber about 2 feet 8 inches square. In this roof each principal springs from a cluster of strong shafts carried up within the walls for the purpose of receiving it. Both structurally and as a means of procuring architectural effect this is very advantageous. There might have been some risk in putting the heavy weight of this roof on parts of the very ancient walls of this venerable hall which had not been so weighted before, and these lines of support divide up the length of the hall, and so make its extent perceptible. They also carry up the apparent (and, in fact, the real) support of each principal from the solid floor, and so aid the architectural treatment in more ways than one. The curved ribs are made very prominent in this truss, and the hammer-beam is kept rather modest than otherwise; it is neither carved at the end, nor marked out by a pendant, so that the line which catches the eye is that of the cusped arch of the moulded rib. This is an original treatment, but the success of the roof fully justifies the architect in the course which he adopted.

With these modern examples we leave our subject. I trust that the accounts of great roofs which I have been able to give you, and the illustrations which, in addition to diagrams made specially for to-night, I have been enabled to show you, by the courtesy of the City Architect, Mr. Waterhouse, Mr. St. Aubyn, and others, have been sufficient to prove that a great timber roof requires no small amount of skill to be brought to bear upon its design. I hope that we have also seen that it, above most things, calls for very careful selection of good material, and, perhaps, most of all for honest, painstaking care in the workmanship of every part. No single joint should be defective, and every part should bear truly on those into which it is framed. I think, also, we have seen abundant cause for ranking timber roofs as among the important architectural features of a large class of ancient buildings, and especially let me add, of ancient English buildings; but I cannot, lastly, help adding that I think we have seen reason also to be proud of our modern works in this line, as well as of the ancient ones. Neither in the architectural design of these structures, nor in the mechanical skill with which they are framed, need the architects or the carpenters of the nineteenth century fear a comparison with their forefathers of the fifteenth and sixteenth.

THE ROOF OF THE MOSCOW RIDING-SCHOOL.

The accompanying cut shows the truss actually used in roofing the famous Moscow Riding-School, built in 1818. The designing of this truss was placed, after several unsuccessful designs had been presented, in the hands of General De Betancourt, Director-General of Highways. After his design was approved, two experimental trusses were erected and severely tested before it was thought safe to begin work on the building. On removing the scaffolding used in erection, one of these trusses settled 0.08 metres, and the other 0.095 metres, but not enough to efface the camber which had been given to the tie. A load of 5,000



bricks, weighing 16,154 kilograms, produced no further effect. This load being doubled, a further deflection of the tie amounting to 0.023 metres was observed, which was not a permanent set, and varied slightly with the hygroscopic condition of the atmosphere. To test the snow-sustaining strength of the trusses, one side of the span was loaded with an additional 5,000 bricks, which produced a visible deflection. Finally a further distributed load of 10,000 bricks was added, which brought the entire load on the two trusses to 80,768 kilograms, or 79½ long tons, exclusive of their own weight. This strain only lowered the tie-rod by 4½ lines, and left it still 0.01 metres above the horizontal. It was observed, however, that the wooden keys inserted in the joints of the tie-beam — which was at first framed as are the principals shown in the cut — had crushed, and this led M. De Betancourt to change the mode of framing the tie-beam to that here shown.—EDS. AMERICAN ARCHITECT.

THE PANTHEON SECULARIZED. — The *Official Journal* publishes a decree restoring the Pantheon to its original use — a receptacle for the remains of great men — and ordering that the body of Victor Hugo be buried there. The funeral took place June 1.

THE BEST TEN BUILDINGS IN THE UNITED STATES.



AS anything like an authoritative expression of opinion the votes cast for the "best ten buildings" in the United States cannot be held to have as much weight as we would like, and so far as this goes we are disappointed with the result; but as we have been furnished with the names of 175 buildings which at least one architect thinks deserving of such rank, the purpose we had in view has been admirably subserved, as we have already stated.

The results of the ballot are as follows: —

Total number of voters, 75.
" " " buildings mentioned, 175.
" " " " receiving more than one vote, 56.

The great proportion of "scattering" votes shows that an adequate judgment could be deduced only from a very much larger number of votes than were cast, but when it is remembered that only 56 buildings received more than one vote each the balance is somewhat restored, and the final selection of the best ten from these 56 buildings may mean a good deal after all — especially in the cases of those which head the list.

The order in which they stand is: —

I. Trinity Church, Boston. Messrs. Gambrel & Richardson, Architects. 63 votes, or 84 per cent of the votes cast.
II. United States Capitol, Washington, D. C. Messrs. Hallet, Hadfield, Hoban, Latrobe, Bulfinch, Walter and Clark, Architects. 41 votes, or 55 per cent of the votes cast.
III. House of W. K. Vanderbilt, New York. Mr. R. M. Hunt, Architect. 37 votes, or 49 per cent of the votes cast.
IV. Trinity Church, New York. Mr. Richard Upjohn, Architect. 34 votes, or 45 per cent of the votes cast.
V. Jefferson Market Court-House, New York. Mr. F. C. Withers, Architect. 23 votes, or 30 per cent of the votes cast.
VI. State Capitol, Hartford, Conn. Mr. R. M. Upjohn, Architect. 23 votes, or 30 per cent of the votes cast.
VII. City-Hall, Albany, N. Y. Mr. H. H. Richardson, Architect. 19 votes, or 25 per cent of the votes cast.
VIII. Sever Hall, Cambridge, Mass. Mr. H. H. Richardson, Architect. 17 votes, or 22 per cent of the votes cast.
IX. State Capitol, Albany, N. Y. Messrs. [Fuller,] Eidlitz and Richardson, Architects. 16 votes, or 21 per cent of the votes cast.
X. Town-Hall, North Easton, Mass. Mr. H. H. Richardson, Architect. 15 votes, or 20 per cent of the votes cast.

Our readers can apply their own reasoning to this result and draw their own conclusions in confirmation of or dissent from this classification without help from us. But as it would take so few votes to exclude from the list about half of those included in it, it seems only fair to give the names of those ten buildings which received the next greatest number of votes, and they are. —

XI. New City-Hall, Philadelphia, Pa. Mr. J. McArthur, Jr., Architect. 14.
XII. Casino Theatre, New York. Messrs. Kimball & Wisedell, Architects. 14.
XIII. Lenox Library, New York. Mr. R. M. Hunt, Architect. 13.
XIV. Produce Exchange, New York. Mr. G. B. Post, Architect. 12.
XV. Columbia College, New York. Mr. C. C. Haight, Architect. 12.
XVI. Broad-Street R. R. Station, Philadelphia, Pa. Messrs. Wilson Bros. & Co., Architects. 11.
XVII. Crane Memorial Library, Quincy, Mass. Mr. H. H. Richardson, Architect. 11.
XVIII. Court-House, Providence, R. I. Messrs. Stone & Carpenter, Architects. 10.
XIX. Central R. R. Station, Providence, R. I. Mr. T. A. Tefft, Architect. 10.
XX. Harvard Memorial Hall, Cambridge, Mass. Messrs. Ware & Van Brunt, Architects. 8.

The manner in which local pride or prejudice did or did not aid in bringing about the above result can be perceived by analyzing the votes cast by architects practising in Boston, Chicago, New York and Philadelphia.

Boston voters, 9 in number, cast 22 votes out of a possible 90 in favor of Boston buildings, as follows: —

For: Trinity Church. Gambrel & Richardson, Architects. 8.
Ames Building, Bedford St. H. H. Richardson, Architect. 3.
Art Club Building. W. R. Emerson, Architect. 2.
New Store for R. H. White & Co. Peabody & Stearns, Architects. 1.
Spiritual Temple. Hartwell & Richardson, Architects. 1.
First Presbyterian Church. R. M. Upjohn, Architect. 1.
State-House. Charles Bulfinch, Architect. 1.
Boston & Providence R. R. Station. Peabody & Stearns, Architects. 1.
Tower of Brattle-Street Church. Gambrel & Richardson, Architects. 1.
Mutual Life Insurance Co. of New York's Building. Peabody & Stearns, Architects. 1.
Hotel Boylston. Cummings & Sears, Architects. 1.
House for J. C. Phillips. Peabody & Stearns, Architects. 1.

Chicago voters, 4 in number, cast 8 votes out of a possible 40 in favor of Chicago buildings, as follows: —

For: the Pullman Building. S. S. Beman, Architect. 2.

	Philadelphia R. R. Station. L. Eidlitz, Architect.	2.
	C. B. & Q. R. R. Offices. S. S. Beman, Architect.	1.
	Cook County Court-House. J. J. Egan, Architect.	1.
	Board of Trade Building. W. W. Boyington, Architect.	1.
	Mr. S. Kent's House. Burnham & Root, Architects.	1.

New York voters, 12 in number, cast 70 votes out of a possible 120 in favor of New York buildings, as follows: —

For:	House of W. K. Vanderbilt. R. M. Hunt, Architect.	9.
	Columbia College. C. C. Haight, Architect.	8.
	Jefferson Market Court-House. F. C. Withers, Architect.	7.
	Trinity Church. Richard Upjohn, Architect.	6.
	Casino Theatre. Kimball & Wisedell, Architects.	5.
	House of Louis C. Tiffany. McKim, Mead & White, Architects.	4.
	House of Henry Villard. McKim, Mead & White, Architects.	3.
	Lenox Library. R. M. Hunt, Architect.	2.
	N. Y. Mutual Life Ins. Co.'s Building. C. W. Clinton, Architect.	2.
	Produce Exchange. G. B. Post, Architect.	2.
	House of Cornelius Vanderbilt. G. B. Post, Architect.	2.
	Union Theological Seminary. Potter & Lord, Architects.	2.
	St. Patrick's (R. C.) Cathedral. Renwick & Sands, Architects.	2.
	Madison Avenue M. E. Church. R. H Robertson, Architect.	2.
	Dakota Flats. H. J. Hardenbergh, Architect.	2.
	Metropolitan Opera-House. J. C. Cady & Co., Architects.	2.
	House of W. H. Vanderbilt. Atwood and Snook [Herter Brothers], Architects.	1.
	Jewish Synagogue. L. Eidlitz, Architect.	1.
	St. Paul's.	1.
	Dutch Reformed Church. Wheeler Smith, Architect.	1.
	Manhattan & Merchants' Bank. Wheeler Smith, Architect.	1.
	Presbyterian Hospital. R. M. Hunt, Architect.	1.
	City-Hall.	1.
	Union League Club-House. Peabody & Stearns, Architects.	1.

Philadelphia voters, 6 in number, cast 21 votes out of a possible 60 in favor of Philadelphia buildings, as follows: —

For:	Masonic Temple. J. H. Windrim, Architect.	4.
	Penn. R. R. Broad-Street Station. Wilson Bros. & Co., Architects.	4.
	New City-Hall. J. McArthur, Jr., Architect.	3.
	Girard College. T. U. Walter, Architect.	3.
	Insurance Co. of North America's Building. Cabot & Chandler, Architects.	2.
	Merchants' Exchange. —— Strickland, Architect.	1.
	St. Mark's Church. John Notman, Architect.	1.
	Philadelphia Trust Co.'s Building. J. H. Windrim, Architect.	1.
	Academy of Music. G. Runge, Architect.	1.
	Post-Office. U. S. Supervising Architect's Office.	1.
	New Jerusalem Church. T. P. Chandler, Jr., Architect.	1.

The votes for the two Providence, R. I., buildings were cast entirely by local architects.

In conclusion we can only say that architects of all varieties of predilections and attainments, practising in every part of the country, have contributed to this result, and that we find considerable internal evidence that their opinions were expressed with care and deliberation.

THE ILLUSTRATIONS.

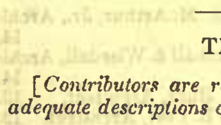
[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

SKETCHES FOR A ROW OF HOUSES FOR MR. T. L. SCHURMEIER, ST. PAUL, MINN. MR. CASS GILBERT, ARCHITECT, ST. PAUL, MINN.

THE alternative design was adopted, although the entire scheme was abandoned, owing to failure to obtain sufficient alley room in the rear. The alternative design was to have been built of brick, faced with Philadelphia pressed-brick and Bayfield brownstone, a sandstone not dissimilar in color to the Longmeadow freestone. The estimated cost of this building was $38,000 complete.

YOUNG WOMEN'S CHRISTIAN ASSOCIATION BUILDING, NEW YORK, N. Y. MR. R. H. ROBERTSON, ARCHITECT, NEW YORK, N. Y.

RENDERING WOOD FOR BUILDING PURPOSES NON-INFLAMMABLE.[1] — II.



IN THE TOWER. LONDON, ENG.

ALL timber, when treated by any of the preservative processes in general use, becomes short; that is, it breaks in two crosswise easily, and when the whole wood is impregnated its tensile strength becomes impaired. It no longer when dry retains the same amount of elasticity it possessed when in its natural state; when in a moist state it recovers a great deal of this. The shortness is easily tested by taking a piece of dry preserved timber, and, trying to split it with an axe, it will be found that the axe will not follow the course of the grain of the wood. This, then, seems a reason in favor of impregnating the wood, and especially the smaller pieces, after they have been cut to fit into their several places. Again Sabine says: "It is necessary that no ungalvanized iron should come in contact with wood impregnated with sulphate of copper (and the same point must be considered when using other salts, otherwise the copper of the solution will be reduced by galvanic action)." Another authority says: "Boucherizing is injurious to the stay wires and bolts as the sulphur so quickly attacks not only the galvanizing of these, but the iron itself, that the stay wires of poles are soon eaten away." This shows that when salts are used for impregnating wood, iron bolts and nails should be protected in some way — by paint, say. Kyanising (chloride of mercury) is equally injurious to iron. Another process for preserving wood from decay is Beer's process in which *borax* is used. It is supposed to neutralize the decaying vegetable matter in the wood, and is also a very good, non-inflammable solution. We have entered thus fully into the methods of preparing wood with sulphate of zinc, chloride of mercury, and sulphate of copper in particular, because whatever may be the non-inflammable solution selected as most suitable, some such method of injection will be necessary if the impregnation is required to be other than merely superficial, in which case the same considerations would apply. Moreover, since all the three above-mentioned are salts, they will not only preserve the wood against rot, the influence of the weather, insects, and worms, but will render it also to a certain degree non-inflammable, but which non-inflammable solution is best we shall probably be better able to judge farther on. But we should, to begin with, put chloride of mercury and sulphate of copper out of the question, as the first is too expensive, and when burnt is turned into vapor which has a fearfully suffocating effect on the nose. Sulphate of copper, though cheap and free from this disadvantage, would turn the wood a blue color when the surface is damp with the moisture in the air. Chloride of zinc and borax, the other two of the above-mentioned processes, both preserve from decay and flame, and might be used for injecting green timber.

But at present let us go through the information that can be gathered on the subject of non-inflammable compounds and solutions. Much of this relates to rendering fabrics non-inflammable, and this is done by steeping them in almost any saline solution. Thus cotton and linen stuffs prepared with a solution of borax, phosphate of soda, phosphate of ammonia, alum, or sal-ammoniac do not suffer active combustion nor burst into flame. The salts act by forming a crust of incombustible matter on the surface of the fibres. They do not, however, prevent carbonization taking place when the temperature is sufficiently high. The cotton thread is reduced to a cinder when burnt; but from the action of the salt, its fibres still retain sufficient tenacity to support a light weight. The addition of one ounce of alum or sal-ammoniac to the last water used to rinse a lady's dress, or a less quantity added to the starch to stiffen them, renders them non-inflammable, or, rather, they will not readily take fire, and if kindled, are slowly consumed without flame. None of the above are used for fine soft muslins, because they render the fabric harsh and destroy all its beauty. The salt which is found to answer all conditions most completely is tungstate of soda: steeped in a solution of twenty per cent of this salt, muslin in perfectly non-inflammable when dry, and the saline film left on the surface is of a smooth and fatty appearance like tallow, and does not interfere with the process of ironing. The non-fulfilment of this last condition completely prevents the use of many other salts, such as sulphate or phosphate of ammonia, which are otherwise efficacious in destroying inflammability. The addition of a little phosphoric acid or phosphate of soda is recommended to the tungstate, for without this a portion of the tungstate is apt to undergo a chemical change and become comparatively insoluble. For a solution of tungstate of soda of minimum strength, dilute a concentrated solution of neutral tungstate of soda to specific gravity, one-fourteenth, and then add three per cent of phosphate of soda. This solution is found to keep and answer its purpose well. Again, in "*Ure's Dictionary:*" "Cotton and linen cloth may be best rendered incapable of burning with flame by being imbued with a solution of sal-ammoniac or of alum." Tomlinson says: "Experiments were tried with forty salts, but out of these only four appear to be applicable to light fabrics, namely, phosphate of ammonia, chloride of ammonium (sal-ammoniac), sulphate of ammonia, and tungstate of soda. The sulphate of ammonia is the cheapest salt, but causes brown spots on the muslin when ironed, and dissolves in water, so that it requires to be renewed after every washing. Tungstate of soda is the only one that does not interfere with the ironing, and consequently is that usually adopted.

"The oxides of tin withstand both the water and the soap, but they impart a yellow tinge, consequently their application has been restricted to canvas, sails, and other coarse materials (and would not affect their use with woods). This is also the case with borate and phosphate of protoxide of tin and arseniate of tin. These last are some of the attempts which have been made to fix some of the non-soluble compounds in textile fabrics. The method of rendering a sailcloth perfectly non-inflammable is to soak the canvas for two days in a protochloride of tin solution of the strength of two parts of the salt to one of water, and to leave it for a day in a concentrated solution of stannate of soda or carbonate of soda. The canvas is lastly dried, and is then ready for use." Also, we find in the "*English Cyclopædia*": "Cotton and linen fabrics may be partially protected from fire by a solution of alum or common salt; but alum weakens the fibres, and the salt makes them harsh and crisp. Borax will exert a considerable preservative effect; but the material is weakened,

[1] A paper read before the Civil and Mechanical Engineers' Society on Wednesday, April 22. By Thomas Manson Rymer-Jones, M. Inst. C. E., F. R. G. S., and John Rymer-Jones, Memb. Inst. Tel., Eng. Reprinted from the *Building News*. Continued from page 258, No. 492.

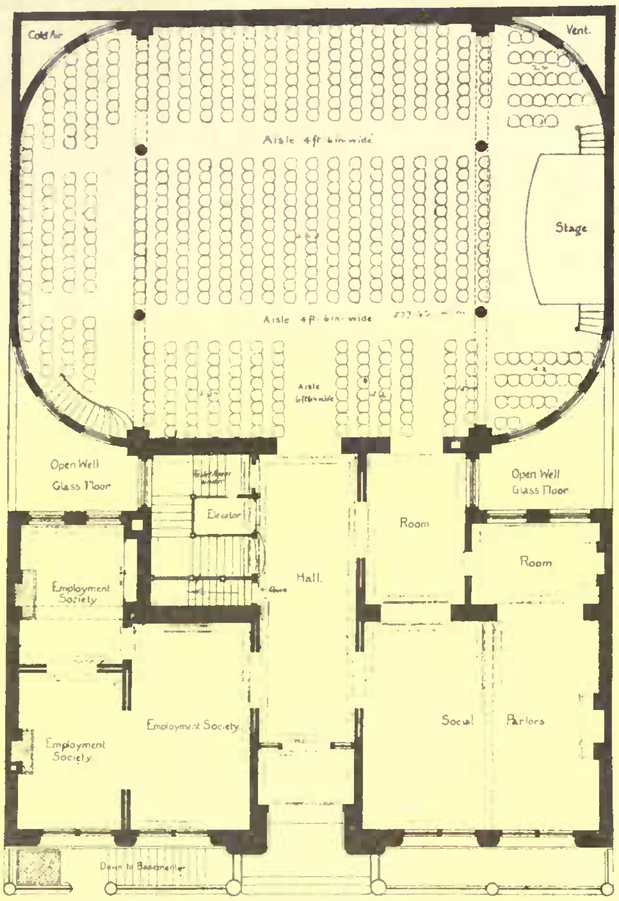
as with alum. It was found that phosphate of ammonia exerts the preservative effect; but the salt becomes decomposed under the laundress's iron. Sulphate of ammonia (only quarter the price of its predecessor) had most of its merits, but the same defect. Tungstate of soda has all the advantages, and is free from the disadvantages." So much for fabrics. Of course, what would be a disadvantage for linens need not be so for woods; but I give the above as an addition to our list of non-inflammable solutions, to guide us to the selections of the most suitable ones hereafter. The "*English Cyclopædia*" says, with regard to wood: "Many methods have been devised for making woods more or less fire-proof. The substance which is attracting most notice now is silicate of soda. Mr. Abel, chemist to the War Department of England, and Mr. Hay, chemist to the English Admiralty, made experiments on this salt is 1857. A portion of a wooden hut was painted three times inside and out with a solution of silicate of soda; but unfortunately for the fairness of the experiment, the building was constructed with a double boarding, so that it was only possible to coat or impregnate each plank on one side; but the value of the silicate was established beyond a doubt. A flame from a large heap of shavings placed against this part of the building for some minutes only succeeded in catching the end of one plank, and even that did not blaze, but only smouldered for a short time. By the heat of the fire the salt was drawn to the surface of the wood, and formed a glaze upon it. Subsequently, when the main body of the hut was destroyed by the fire, after several unsuccessful attempts to extinguish it by Philip's Fire Annihilator (for testing the efficacy of which the experiment was made, the silicate of soda experiment being only a secondary one), although the fierceness of the flame was such that few materials could have withstood it, yet several planks remained of the exterior coated portion. Upon examining the planks the unprotected surfaces were found to be completely charred, but this charring only extended to those parts which had not been touched by the silicate. Asbestos paint has been used with nearly similar results. So far as experiment has gone silicate of soda appears the most convenient and effective known for the purpose."

Again, respecting silicate of soda, "*Spon's Workshop Receipts*" says: "Deal boards become almost incombustible when painted over with a diluted solution of silicate of soda, called also glass-water. The glass-water is generally sold as a thick fluid like honey. This may be thinned out with water six or seven times its own bulk; the water must be soft, or boiled water will do, and the solution applied warm. In about twenty-four hours apply a second coat, and perhaps a third. Use a new brush and wash the brush in clean water after using, or it will get too soft. Avoid grease or fat on the boards before painting them." In the same book is another receipt as follows: "Soak the wood in a strong solution of alum and sulphate of copper — about one pound alum and one pound sulphate of copper should be sufficient for one hundred gallons of water. These substances are dissolved in a small quantity of hot water, then mixed with the water in the vessel in which the wood is to be steeped. The timber to be rendered fireproof can be kept under the liquor by stones, or any other method of sinking it. All that is required is a water-tight vessel of sufficient dimensions to hold enough of the liquor to cover the timber, which should be allowed to steep for four or five days; after this it is taken out and allowed to dry thoroughly before being used." This would be a very good plan to adopt with the upright timbers after thoroughly injecting them by the system of Boucherising, as before explained, whilst the timber is green. As the Japanese use their wood plain, the blue sulphate of copper tinge would hardly do for the lighter wood-work. With regard to Burnettizing sulphate of zinc, which, as before mentioned, has been largely used as a preservative against decay, there is no reason why it should not be used for every part of the wood in a house, injecting it whilst the wood is green, as it acts chemically on the sap, and is white. Sir W. Burnett says of it, that it renders the wood non-inflammable. The following is extracted from his pamphlet on the subject: "For preserving timber, canvas, cordage, and woolen things from dry-rot, mildew, moth, and the destructive influences of the elements, salt water, so far from hastening decay or neutralizing its effects, has, on the contrary, the quality of increasing its efficacy; it is perfectly innocuous and cannot endanger health. All the timber and ceilings of a ship may be impregnated with the solution without the slightest prejudicial effect on the crowded inmates. It retards the oxidization of metals, as has been proved repeatedly upon copper and iron bolts with the most satisfactory results, and articles prepared with this solution will resist combustion in proportion to the strength of the solution used." Again, another method: "In Maughan's process dry wood is saturated with an aqueous solution of phosphate of soda and muriate or sulphate of ammonia. A decomposition ensues, followed by an evolution of ammoniacal vapor and the formation of an incombustible coating on the surface of the wood." Jackson's patent consists in the application of a solution of salts of zinc and ammonia. Mr. Payne's wood-preserving process is well known. Wood is readered fireproof by means of a solution of sulphuret of barium or calcium. The wood or other vegetable matter is put into an air-tight vessel from which the air is driven out by means of steam. The steam is condensed by the injection of the solution of the sulphuret, and by the application of cold water to the outside of the vessel. A partial vacuum being thus obtained, the solution is allowed to flow into the vessel from the tank containing it through a pipe furnished with a stop-cock. The stop-cock is then closed, and an air-pump connected with the vessel is worked until as perfect a vacuum as possible is obtained within the vessel. The cock is then again opened to allow the solution to fill the vessel nearly. It is then shut, and by means of a force-pump a further quantity of solution is introduced until the pressure on the interior of the vessel amounts to one hundred and ten pounds to one hundred and forty pounds per square inch. This pressure is maintained for an hour and the solution is then drawn off. The vegetable matter is then impregnated in a similar manner with an acid or a solution of some substance, such as sulphate of iron, which will unite with the barium or calcium, and set the sulphur free. When the vegetable matter is to be impregnated with a large quantity of solid matter it should be dried between the application of the two fluids. By this means an insoluble sulphate of lime or sulphate of barium is formed in the body of the wood, which is thus rendered nearly as hard as stone. Wood so prepared is now largely employed in English public works and railways.

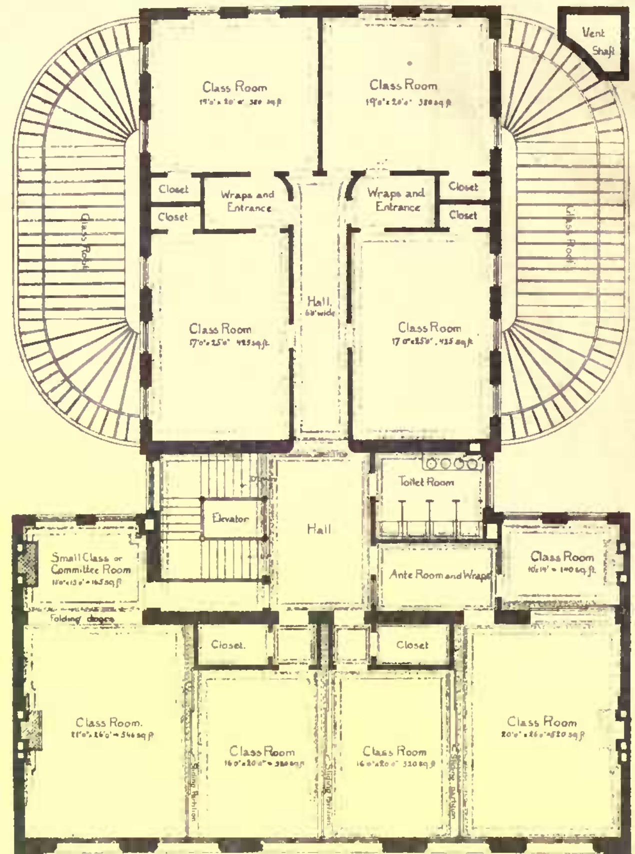
Of this same process Payne himself says: "By impregnating wood with a solution of metallic oxides, alkalies, and earths in various proportions, using exhaustion and pressure to do it, and then in order to prevent the disunion of such solutions by introducing another solution by a similar means, an insoluble substance is formed in the interstices of the woods. Wood subjected to this process is not only proof against wet and dry rot in every situation, but will not communicate flame, and will resist the attacks of insects. The most porous, the softest, and, of course, the cheapest woods are rendered equal in point of usefulness, durability and strength to the hardest and best description of timber. Wood thus prepared is susceptible of the finest polish. As a preventative to the spread of flame, especially in countries where the houses are for the most part composed entirely of wood, and in most cases covered with wood shingles — the use of this process will be of the utmost importance, and will greatly lessen, if not entirely prevent, the dreadful catastrophes so frequently occurring there from fire. For all outdoor work, to whatever inclemency of weather it may be exposed, the advantages are great, and also for sleepers and other works on railways, as also for wood pavement. For canvas and cordage, by the proper application of this process, all the advantages named are communicated without injury to their elasticity. Sails, rigging of ships, canvas for tents, tarpaulings, etc., are by this means effectively protected and improved.

Again, "*Herbert's Encyclopædia*" says: "Many ingenious experiments have been resorted to to render wood fire-proof. Solutions of muriate of ammonia, muriate of soda, sal ammoniac, borax, alum, and several other salts and alkalies have this property to a certain extent. Professor Fuchs invented a solution for this purpose — ten parts potassa or soda, fifteen parts of pure silicious earth, and one part charcoal, mixed with water. This composition, applied to the surface of the wood, forms a vitreous coat, which effectually resists the action of fire. Decisive experiments fully established the efficacy of this plan, and the Royal Theatre of Munich was protected by the application of this composition. The surface covered was upwards of four hundred thousand square feet, and the expense, it is said, did not exceed five thousand francs — two hundred pounds, or less than four shillings for four hundred square feet. The following is an English composition for a like purpose: One part, by measure, of fine sand, two parts of wood ashes, and three parts slaked lime ground together with oil, and laid on with a painter's brush; the first coat thin, and the second thick. This forms a very strong and adhesive compound which is both fireproof and waterproof. Again, Solomon's patent consists in a peculiar application of two solutions to the surface of the wood, the first consisting of sulphate of alumina, glue, and water, and the second of chloride of calcium, glue, and water." Also in "*Spon's Workshop Receipts*": "A wash composed of lime, salt, and fine sand, or wood ashes, put on in the ordinary way of whitewash, renders a shingle roof fifty-fold more safe from fire from falling cinders in case of fire in the vicinity. It has also a preserving influence against the effect of the weather. The older and more weather-beaten the shingles the more benefit derived. Such shingles are generally more or less warped, rough and cracked. The application of the wash by washing the upper surface restores them to their original or firm form, thereby closing the space between the shingles and the lime and sand; filling up the cracks prevent it from warping. By the addition of a little lampblack the wash may be made of the same color as old shingles, and thus remove the offensive glare of a white-washed roof."

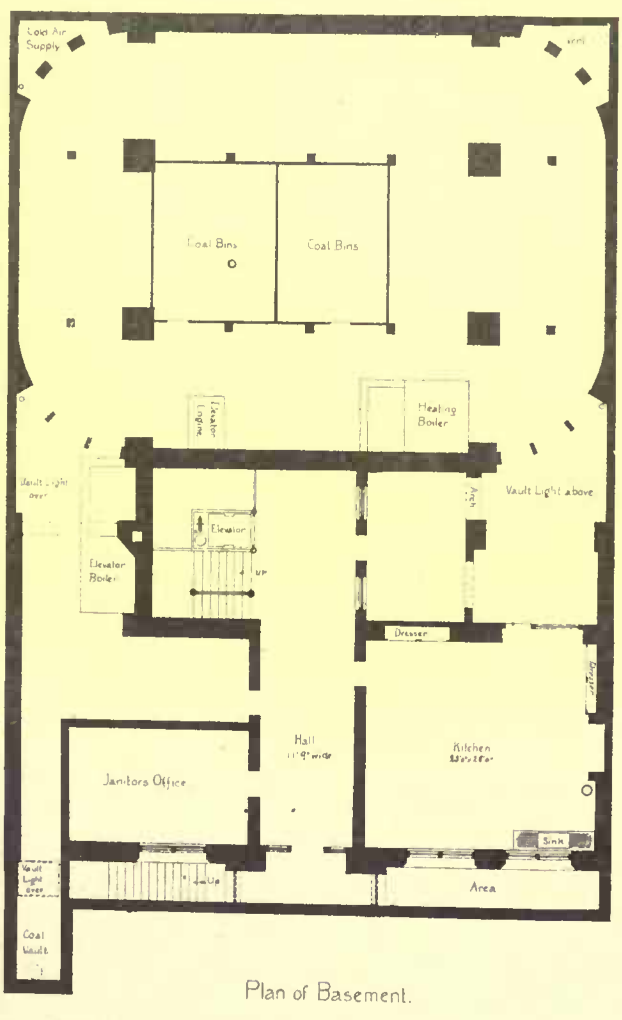
Such is the information we are able to gleam so far; and before offering any suggestion of our own as to the best mode of proceeding let us remember that to season timber in the ordinary way requires seldom less than three years', often six or eight years', exposure to the air freely; and though (owing to suffocating fumes emitted when exposed to great heat) Kyan's (chloride of mercury) is out of the bnestion for us, still by the Burnettizing (chloride of zinc), Boucherizing (sulphate of copper), and Beerizing (borax) systems the destructive principle (sap) is dried and rendered inert. They render larch, firs of all kinds, willow, birch, elm, beech, ash, poplar, etc., of considerable value for durable purposes. We would, therefore, suggest for houses already built: Apply several washings of silicate of soda to the fixtures of every description, and let the removable lighter work, roof shingles (when used), mats, etc., soak several days in the same solution. Where shingle roofs are used, let these be afterwards coated with lime, salt and fine sand, or wood ashes. When new houses are to be built, impregnate the main or thick timbers thoroughly with chloride of zinc by pressure, obtained as in Boucherizing, whilst the timber is green; allow it to dry thoroughly before fixing, and paint the



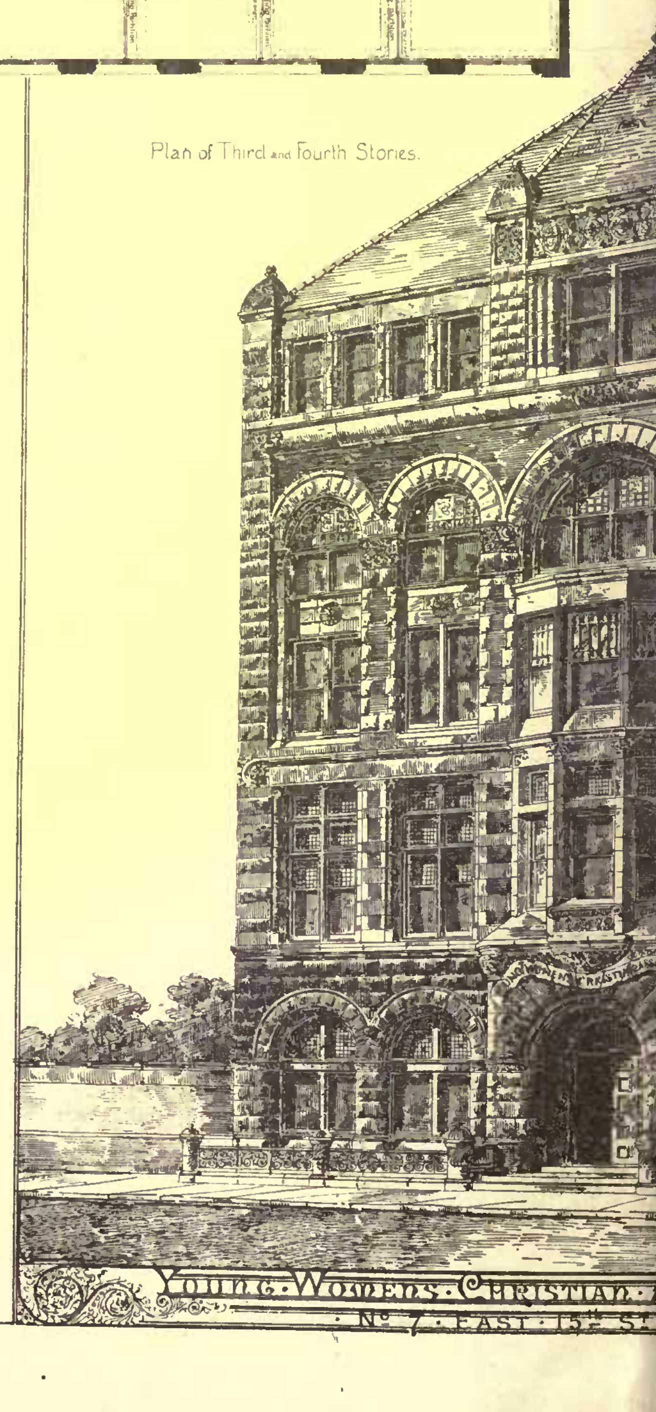
Plan of First Story.



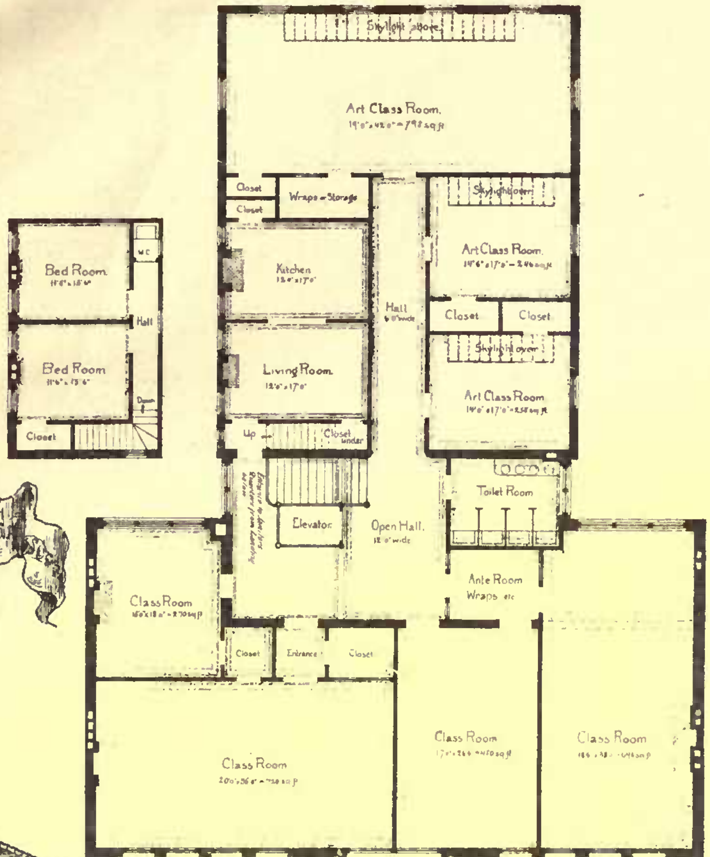
Plan of Third and Fourth Stories.



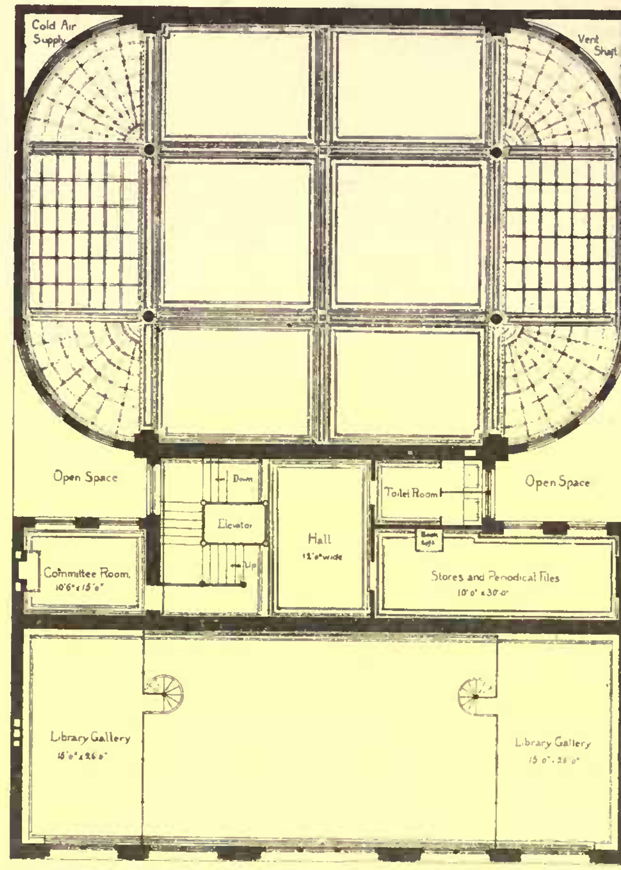
Plan of Basement.



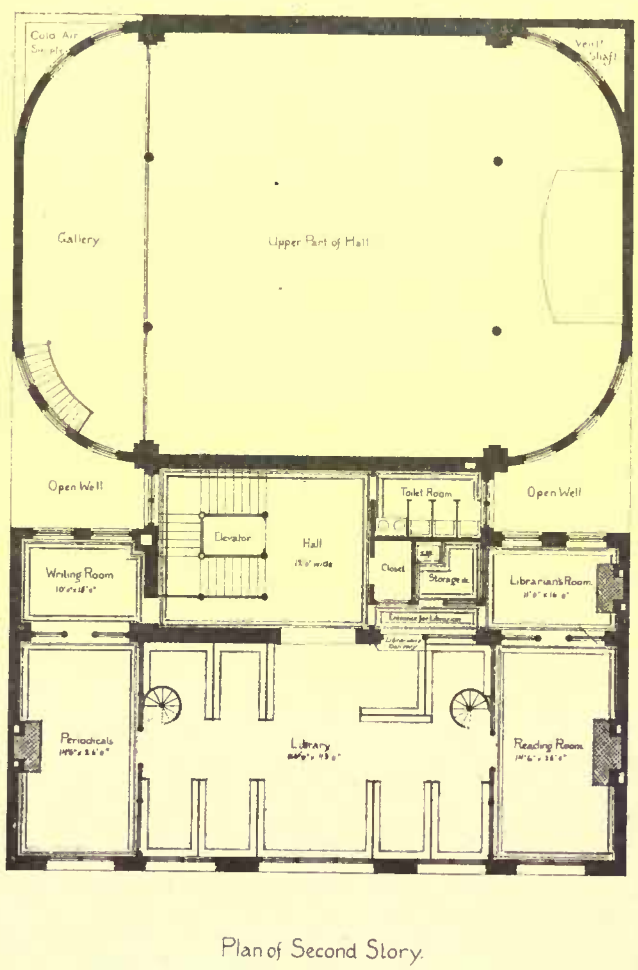
R OSGOOD & CO



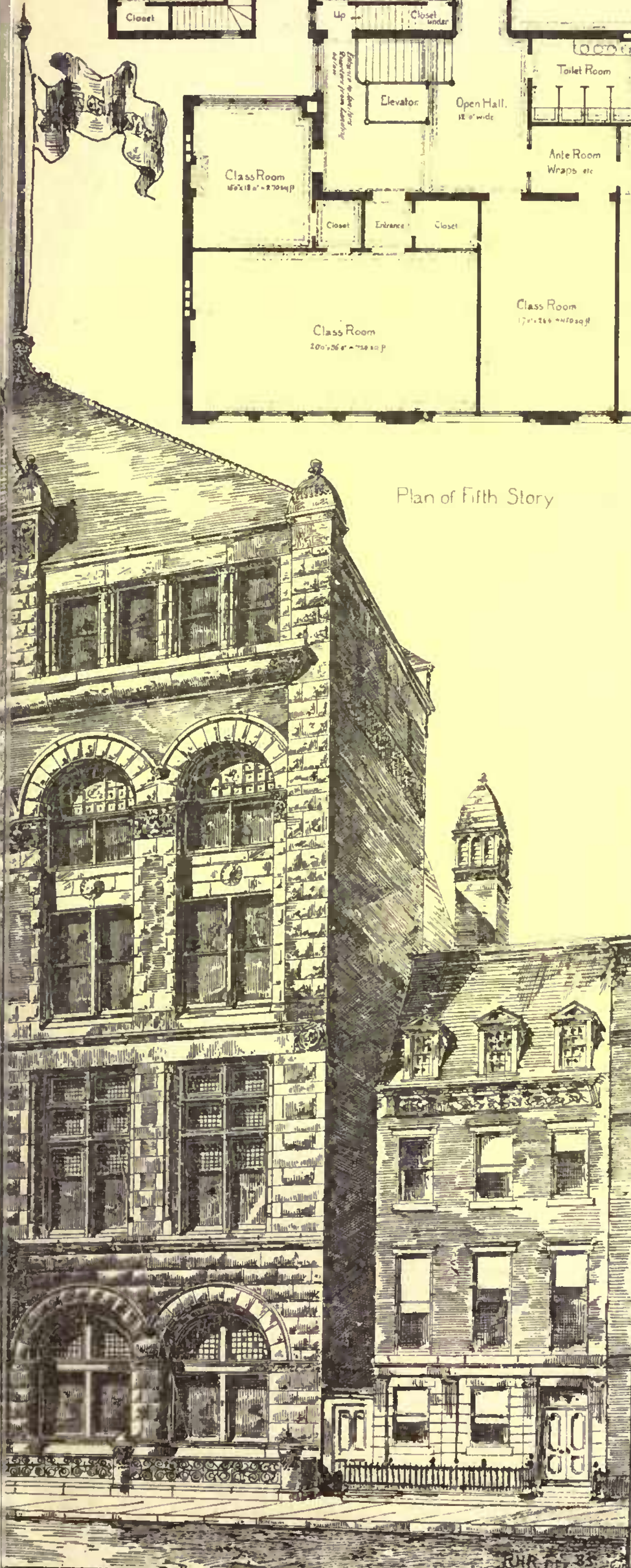
Plan of Fifth Story



Plan of Intermediate Story.



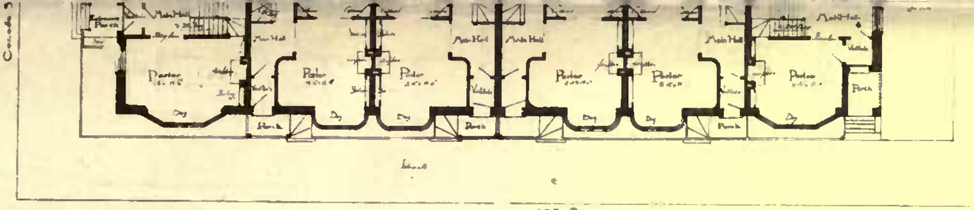
Plan of Second Story.



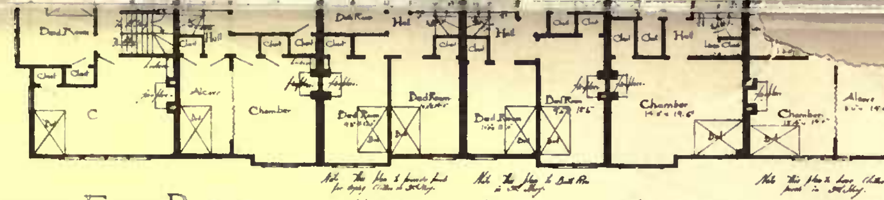
SOCIATION · BUILDING
EW · YORK · R · H · Robertson · Archt.

HELIOTYPE PRINTING CO. BOSTON


Notes: 1st Story to be of Common Brick trimmed with Pressed Brick. 2nd Story of Akron Red Terra Cotta Tile. Gables rough cast plaster. Roof Black slate.
Study for a Row of Houses for Mr. T. L. Schurmeier.
St Paul Minnesota.
Cass Gilbert. Architect. 19 Gilfillan Block. St. Paul.
Alley
Kitchen
Porch
Dining Room
Bed Room



· First Floor Plans ·
of "Row", for Mr. T. L. Schurmeier :
Cor. 10th and Canada Sts. St Paul, Minn.



Second Floor Plans ·
of "Row" for Mr. T. L. Schurmeier :
Cor 10th and Canada Sts. St. Paul. Minn.

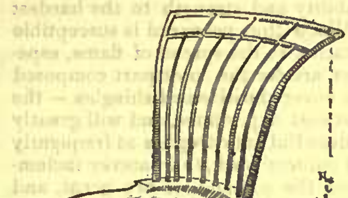


Cass Gilbert Architect.
49. Gilfillan Block. St Paul. Minn.

Alternative Study for
'Row' for Mr. T. L. Schurmeier :
: St. Paul : Minnesota :

outside with silicate of soda three times when in position. The ligher woodwork, shingles, etc., can be cut from large balks thus impregnated, and afterwards washed superficially with silicate of soda; or this thin wood-work may be saturated by steeping in silicate of soda for several days. By the use of the above comparatively simple and inexpensive remedies, all complicated steam-pressure paraphernalia, vacuum pumps, etc., are avoided. The area of fires would be greatly reduced, whilst a scheme of fire assurance would become feasible where these precautions were taken by the inhabitants of any block of buildings, as any spread of a conflagration would be arrested and kept in check at such a small loss to the outside houses of the block as would fall lightly on any company holding an assurance on the whole block. The inhabitants of any block of houses might assure against fire amongst themselves, on condition that the above precautions were observed by all, whilst any jealousy on account of vested interests of firemen might be met by paying a certain sum to be approved by former statistical returns, to fire brigades, and deducting according to the number and extent of fires, not to pit any district fire brigade against another for a prize, as that would only lead to a prevalence of fires (accidental, of course,) in opposing districts.

THE NEW OBSERVATORY DOME AT NICE.



THE observatory cupola, or movable dome, which has just been completed in some big shops out at Lavallois Perrier, is said to be the largest work of the kind ever constructed. This I was told a fortnight ago, and yesterday I went out to Lavallois — a suburb of Paris, just beyond the walls — to see it for myself. I do not know that this is the biggest movable cupola ever built, but it certainly is enormous. The history of its construction is interesting.

Four years ago, the Minister of Public Works organized a competition for the construction of a new cupola for the Paris Observatory. The one which now crowns the astronomical tower of that institution was constructed according to a design prepared by the famous astronomer Arago, but it is not large enough to contain the enormous telescopes which are at the disposal of astronomers to-day. Nor can it be manœuvred as easily or as rapidly as is desirable. Naturally, the problem to be solved in the construction of an observatory cupola is not only to make it large enough to contain the various instruments used in studying the heavens, but also so that astronomers can follow the movements of stars, some of which arise on one horizon in the evening to set at the opposite side the next morning. Telescopes are pointed at stars through a slit which extends from the top to the bottom of one side of the cupola, and as the cupola is so arranged that it can be turned on its axis, it is possible to direct telescopes to any desired quarter of the heavens. The Arago cupola at the Paris observatory is thirty-nine-and-one-half feet in diameter, and rests on iron wheels or rollers. One evening at the Paris observatory I noticed that it took eight men to manage the ropes and windlass by which it was turned, and it gave them all they could do to get it to make one complete revolution in forty-five minutes. When the great comet paid us a visit three years ago, I was one of a party who were invited to the observatory to take a look at it through a big telescope, and, on that occasion, I noticed that the eight men had been superseded by a small gas-engine, with which it was possible to get the cupola around in ten minutes; but even this is not as quick as the astronomers would like, and a gas-machine not only takes up a great deal of room, but its motion is apt to jar delicately-adjusted instruments in the tower.

For the new cupola of this old observatory seven plans were sent in to compete for the prize offered by the minister. Six were nothing more than modifications of the Arago cupola, but the seventh was founded on an entirely new principle. Its architect is M. Eiffel, a mechanical engineer, the same who projected an iron tower nine hundred and eighty-five feet high, which, if constructed, will be one of the features of the Universal Exposition to be held here in commemoration of the Centennial of the Revolution of 1789. His project for the observatory cupola is founded on the Archimedean principle that a body loses in water a portion of its weight equivalent to that of the water which it displaces. Supposing that a cupola weighed one hundred tons, M. Eiffel proposes to support it by means of floaters on the surface of a ring-shaped tank large enough to contain four hundred and fifty thousand gallons of water; the floater thus forms a circular boat, so to speak, without prow, keel or stern, and, in order to make it turn on its axis, it would only be necessary to provide sufficient power to overcome the very trifling resistance presented by the water. This project was so new, so bold, and so simple, that it frightened a majority of the experts to whom the minister had referred the awarding of the prize, four out of the seven members of the jury voting against it. They reported that the reasons which impelled them to do this were that they saw no way to prevent the rusting of the tank and floater; that, even if it were possible to construct such a cupola, it would be impossible when once built to take it down for repairs, and that such a large floating mass would never be able to resist the force of the winds to which it would be exposed. The other three experts reported favorably on Eiffel's project, and one other, Admiral Monchez, superintendent of the Paris Observatory, was so favorably impressed with it that he succeeded in getting the minister to adopt it as the one for the new cupola — a decision, by the way, which did not do the inventor much good, for, though it was made four years ago, the lack of appropriation has prevented it from being carried into effect.

Another member of the jury who was also satisfied that Eiffel's project was an entirely feasible one was M. Charles Garnier, the architect who built the Grand Opera-House in this city, and it so happened that he was then preparing plans for the erection of an observatory of which a wealthy Jew by the name of Bischoffsheim had made a present to the town of Nice. M. Bischoffsheim had told Garnier that he wanted to build an obseratory which would be bigger and better arranged than any existing institution of the sort, and when the architect told him about the Eiffel cupola the rich banker authorized the construction of one upon that principle for the tower of the Nice observatory. It was this cupola that I went out to see at the workshops where it has been put together and is now undergoing severe tests. It is an iron affair throughout. The cupola floats, as I have already said, in a tank filled with water. This round tank has two walls; from the inner to the out ring or wall is a distance of three feet ten inches (one-and-one-fifth metres), and the depth between them is one-and-one-half metres — that is to say, a little more than five feet. The diameter or distance across the inside of the tank is seventy-three feet (twenty-two-and-four-tenths metres). The cupola cover which is to inclose the telescope and other astronomical apparatus has a diameter at the base of a trifle more than seventy-three feet, and its highest point is seventy-six-and-one-half feet. Its base rests on what is called a floater; this is also of iron, and is of very nearly the same dimensions as the ring-shaped tank. It sets down into the opening between the circular sides, than which it is twenty-five centimetres narrower. From this floater rise sixteen steel stanchions, bowed to form the ribs of the cupola, and dividing it into so many equal segments. On these ribs are laid six hundred and twenty sheets of steel; each sheet is one-and-one-half millimetres thick, and they are fastened together by fifty-five thousand rivets. The whole floating mass weighs ninety-five tons, and it with the tank in which it swims is of the same size as the tower of the observatory building on top of which it is to be placed. Pure water will not be used, as in cold weather that would freeze too quickly, and moreover it would soon rust the iron: forty-one thousand five hundred gallons of a strong solution of chloride of magnesium will be used instead. This liquid will not freeze even when the mercury is fifty degrees below zero, Centigrade, a degree of cold unknown in France. Being one-fourth denser than pure water, there need not be so much of it, and it does not eat the iron. One man with a single windlass can cause this floating cupola to make a complete revolution inside of four minutes.

The opening through which the telescopes are to be pointed is closed differently from that of the Paris observatory, where it is shut by means of trap-doors so heavy that it takes two men to move them. In the Eiffel cupola the opening is closed by two blinds, sliding on iron rails each five feet wide, thus making, when pushed apart, a gap of ten feet extending from top to bottom of one side of the dome. These sliding blinds can be handled by one man. The equatorial which this dome is to contain is said to be the largest of its kind in existence. French astronomers say so, and they may be speaking truthfully for all I know. It is a telescope undoubtedly of great power. The object and the occular glasses are eighteen metres, or precisely fifty-nine feet apart; the diameter of the object glass is seventy-six centimetres, or twenty-nine-and-three-fourths inches. It was ground and polished by Feil of Paris, and the Henry Brothers are now testing it at the observatory.

Next week all this iron work will be taken down and shipped to Nice. Thence the several parts will be carried to the observatory and put together again. There at the top of Mont Gras it will tower up amid the solemn silence of rocks and forests, in the presence of two of the most sublime landscapes that nature has ever prepared for man's contemplation — on the one side, the orange groves, towns, villages and villas encircling the Mediterranean which stretches out like a vast blue mirror in the dazzling sunlight, on the other, the plains of Provence, and, in the distance, the long line of Alps with their snowy peaks. Under the cover of this cupola the astronomers of the Nice observatory will continue their researches amid the abysses of the heavens which have already been rewarded by so many astronomical discoveries. With the aid of the instruments the observatory already possesses, M. Perrotin, the superintendent, and his assistant astronomers, M. Charlois and M. Thollen, have carefully studied, examined and measured the double stars and planets of our solar system, and by means of an ingenious apparatus invented by M. Thollen, they have penetrated the secret of the chemical constitution of the sun. With the aid of this apparatus a solar spectrum of forty-five feet in length can be obtained, in which are more than ten thousand spectral lines, most of them being the same as those cast by the elements that exist on this planet. By comparing these solar and terrestrial lines, science obtains a knowledge not

only of the elements existing in the sun, but is led to make the discovery of elements the presence of which on our earth was not thitherto suspected. By reason of its exceptional location, the excellence of its instruments, and the skill of its astronomers, the Nice observatory, although not yet fully complete and equipped, has obtained quite a reputation throughout the scientific world. Its formal inauguration will take place next October in the presence of a geodetic congress which will be held during that month.

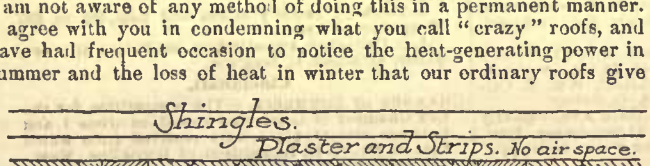
The gentleman who is responsible for this great work which thus crowns the Alpes-Maritimes is named Raphael-Louis Bischoffsheim, and he is one of the financial kings of the French republic. His father, Louis Raphael, was a Mayence Jew. Tired of living a poor man in his native town, he drifted off to Amsterdam, where others of his race had preceded him. Three years after his installation in that old Dutch town, Raphael's wife was delivered of a son, the same who to-day holds high rank as the friend of astronomers. For a while old man Bischoffsheim had a rather hard time of it, but one day he thought of Constantinople, and thither he went in search of fortune. Not long after his arrival at the Turkish capital an idea struck him which turned out to be a real stroke of genius. In those days, more so than now, coins of all nations circulated in Turkey, but the government reserved the right of fixing what moneys should be legal tender in payment of taxes. One day Bischoffsheim went to the Grand Vizier and proposed that they should go into partnership. The Jew was to make a corner in the coinage of certain nations, and when he had got them all in his possession the Turkish official was to direct that that sort of money and no other would be acceptable to the tax-collectors. The operation panned out well, and was repeated so often that both Jew and Mahommedan made millions out of it. This was the origin of a fortune which, along about 1850, Bischoffsheim transferred to Paris; here he opened a banking-house, and took out naturalization papers for himself and his son. He managed to have a finger in most of the good speculations that were got up at the bourse, and, after a while, set up as a protector of art and actresses. One day he thought he would like a stage of his own, which he contemplated converting into a sort of unofficial conservatory, and so he dug a hole in the ground and built a theatre around it which he called the Théatre de l'Athénée; on top of the theatre he built a hotel, and thus got square for the loss which the one house occasioned him by charging a big rent for the other. This was in 1866, and, until two years ago, travellers who put up at the Hôtel de l'Athénée ran nightly danger of being burnt alive if the theatre should happen to take fire. The chief of police finally decided that the building was unsafe, and forbade its being used as a theatre any longer. The old man gave away a great deal of money, and was always in hopes that his charity would cover up the stains on his Turkish piastres. In this he was so successful that when he died the papers all spoke of him as "the wealthy banker and great philanthropist." His son continued the banking business, but one day he got very badly caught in Honduras railroad bonds, and since then he is careful what he does in a speculative way, and never acts in large affairs without the advice and coöperation of his father-in-law, Baron Erlanger. He goes in for science and politics strongly, however, and perhaps one reason why he built the observatory at Nice was that he knew it would get him elected to the Chamber as deputy for the Alpes-Maritimes. The observatory is entirely his own work; he has spent several million francs in the purchase of ground, erection of buildings, equipping it with instruments and providing an endowment for the support of the personnel. Such acts of public spirit are very rare in France, where the idea that it is possible to do anything of this sort without governmental aid and management never seems to enter anybody's head. — *Henry Haynie in the Boston Herald.*

DESIRABLE CHANGES IN MODERN ROOFS.

New York, June 1, 1885.

Edward Atkinson, Esq.: —

Dear Sir, — Your article in the last *American Architect* has interested me very much. I do not think, however, that your suggestion for a "2″ plank roof plastered on the inside" is altogether feasible. Leaving out of consideration the fact that it is only capable of application in the simplest kind of roofs, there is a practical difficulty in applying plaster so as to form a solid body with the wood. At least, I am not aware of any method of doing this in a permanent manner. I agree with you in condemning what you call "crazy" roofs, and have had frequent occasion to notice the heat-generating power in summer and the loss of heat in winter that our ordinary roofs give



rise to. It is evident that the remedy must be comparatively inexpensive before it can be advocated for our ordinary houses or "shingle palaces."

The roof of my own country cottage is made of shingles nailed to strips on the rafters. The attic, at present, is entirely unfinished. I want to finish it, and it occurred to me after reading your article that I might do it economically in the following manner: First, plaster the under side of shingles between the shingle strips, then fill in between the rafters with 2″ plank 14″ wide (this being the distance between rafters) running up to ridge line. To cover any possible cracks between the rafters and planking, put a moulding in the angle. I would leave the rafters and planking to show in the rough, applying perhaps a stain for finish. The cut shows what I mean.

If 2″ x 14″ plank could not be had, suppose I made it 2″ x 12″ and filled in 1″ on each side under the moulding with plaster?

I would be obliged to you for an expression of opinion on the above through the columns of the *American Architect.*

Respectfully yours, F. A. Wright.

Boston, Mass., June 4, 1885.

To the Editors of the American Architect: —

Dear Sirs: — In reply to the questions put to me by Mr. Wright I beg to say that I am very glad to find that my theory is so well sustained both by him and also by an article in *The Builder* of April on the expediency of adopting flat roofs. I have also learned that I have plagiarized from Charles Reade in the latter theory without knowing it.

With respect to the specific questions put to me by Mr. Wright, I reply that according to our mill experience there can be no question as to the plan which he proposes to adopt in his country cottage. If his shingles had been laid upon an ordinary boarded roof it would suffice to place inside boards lengthwise between the rafters, making a roof two inches thick aside from the shingles. This has been done in several factories where the old construction caused the roofs to be unsafe: namely, vertical sheathing cutting off the eaves and a horizontal sheathing making a cock-loft above. At our instance this sheathing has been removed, opening the attic throughout, and the same material has been screwed up between the rafters to the under side of the roof boards, so as to make the roof two inches or two boards thick. Attics which had been excessively cold in winter and excessively hot in summer before this change was made, have thus been made entirely useful and comfortable in both seasons.

With respect to the practical difficulty suggested by Mr. Wright in applying plaster so as to form a solid body with the wood, it would appear that Mr. Wright is not familiar with what is known in mill practice as "dove-tail lathing." Before wire-lathing had been introduced it was our practice to recommend the protection from fire of the ceilings of picker-rooms by plaster laid on "dove-tail lathing" on the under side of the plank between the heavy timbers of the next floor. The "dove-tail lath" is made thicker than the common lath, bevelled on each side and nailed snug to the plank; the bevels held the mortar against any possible jar upon the floor above. Laths are sometimes made in the form of a button with a rather long shank, in order to accomplish the same purpose.

In reply to your own question as to the danger of "dry rot" in case wood is substantially cut off from actual contact with the air by means of plastering, or otherwise, I beg to say that this matter has received very close attention.

Very many years since the heavy timbers in the extension of the Mason & Hamlin Organ Company's works were protected with a thick coat of plastering laid on wire-lathing so close as to leave no air space on three sides of the timber, and a three-inch plank was laid over the top side as tight as it could be made, the plastering being continued between the timbers on the under side of this plank. The timbers were ventilated at the ends. About three years ago, at my request, a part of this plastering was removed; the timber was found perfectly sound and very fresh in appearance, especially where there had been an absolute contact with the mortar. Rough plastering appears to be sufficiently porous to permit the percolation of air and the evaporation of the moisture of green timber, in this respect entirely differing from paint. If a second or finishing coat of lime putty were added, it might be somewhat dangerous to the timber.

The danger of painting heavy timbers before they have had time to season is apparent, and yet it is a blunder frequently repeated.

My own personal experience happened many years since in a building constructed by a corporation of which I was treasurer. It was two hundred feet by one hundred feet, five stories high, divided into equal sections by a party-wall. One section was leased as soon as it was finished and the timbers were painted. The other section stood nearly three years unfinished, with timber entirely bare, and was then taken by the same parties who had leased the first section. While the finishing of the second section was going on the timbers were examined and found to be perfectly sound. Some suspicion, however, led to an examination of the timbers in section number one, which had been painted, and nearly every one of them had to be taken out, having been almost destroyed by having been painted before they were seasoned.

Yours very truly, Edward Atkinson.

A New Court-House for Sale. — Ten years ago the new Court-House, on Seneca Street, Cleveland, was built at great cost to the county. Since that time the mammoth structure has served only to furnish quarters for the Probate and Criminal Courts and Prosecutor's office. The old Conrt-House, on Monumental Park, has been enlarged, and the County Commissioners have now decided that the new Court-House, which always stood as a monument of extravagance and folly had better be sold. —*New York Times.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

318,452. VENTILATED SEWER-PIPE. — Michael J. Coholan, New Britain, Conn.

318,464. MITER-BOX. — Thompson E. Garusch and Thomas Jones, Viola, Wis.

318,472. ELECTRIC SIGNAL-BELL. — Chas. Henzel, New York, N. Y.

318,490. BRICK-KILN. — Thomas McNicholas, Memphis, Mo.

318,494. VENTILATOR. — Adolph Olsen, Boston, Mass.

318,495. LATHING - APPARATUS. — Stuart Perry, Newport, N. Y.

318,507. WINDOW COLD - AIR REFRIGERATOR. — Charles W. Roth, New York, N. Y.

318,508. AUTOMATIC FIRE-EXTINGUISHER. — Marcus Ruthenburg, Cincinnati, O.

318,528. DRAUGHTING-TABLE. — Henry C. Weeden, Boston, Mass.

318,561. RATCHET - DRILL. — Henry D. Hinckley, Hartford, Conn.

318,576. SASH-FASTENER. — Charles W. Nida, New York, N. Y.

318,578. MECHANICAL TRAVERSE - TABLE. — William D. Patterson, Savonas Ferry, British Columbia, Canada.

318,592. FRAME BUILDING. — Lewis W. Beard, Arcadia, La.

318,600. FIRE - ESCAPE. — William C. Cronemeyer, Pittsburgh, Pa.

318,626. TRUSS FOR ROOFS OF BRIDGES. — John H. Jones, Clio, La.

318,632. CHIMNEY-COWL. — Ira G. Lane, New York, N. Y.

318,647. ELECTRIC BELL. — Augustus H. Palmer, Utica, N. Y.

318,648. ANCHOR FOR BUILDINGS. — Frank D. Paradise, Memphis, Tenn.

318,661. FLOOR - COVERING. — Rudolph Schroeder, New York, N. Y.

318,684. KNOB-ATTACHMENT. — Charles H. Beebe, Norwich, Conn.

318,724. ROOFING-SHINGLE. — Giles Hall, East St. Louis, Ill.

318,736. WINDOW-SASH. — Chester J. Holmes, Stafford Springs, Conn.

318,743. AUTOMATIC FIRE-EXTINGUISHER. — James A. House, Bridgeport, Conn.

318,744. FIRE - EXTINGUISHER. — James A. House and Charles H. Dimond, Bridgeport, Conn.

318,749. CAP FOR CHIMNEYS AND SMOKE-STACKS. — Horace F. Keen, Philadelphia, Pa.

318,791. PAINT. — James P. Perkins, Pullman, Ill.

318,792. METHOD OF MAKING BRICK, ETC. — James P. Perkins, Pullman, Ill.

318,799. WINDOW - SCREEN. — Josiah K. Proctor, Philadelphia, Pa.

318,834. BURGLAR - ALARM. — A. Clarke Tonner, Canton, O.

318,842. WATER-CLOSET. — David Whiteford, Chicago, Ill.

318,870. WALL FOR REFRIGERATOR STRUCTURES. — Andrew J. Chase, Boston, Mass.

318,871. WINDOW-SCREEN. — George R. Clark, Dubuque, Iowa.

318,872. ROOFING AND SIDING-BOARD. — James W. Crabbe, Brooklyn, N. Y.

318,890. SASH-PULLEY. — Jacob D. Fyke, Los Angeles, Cal.

318,899. VALVE FOR WATER-CLOSETS, ETC. — Geo. Haydn, Baltimore, Md.

318,910. ROOFING FELT AND ITS MANUFACTURE. — Josiah Jowitt, Stanley, N. J.

318,912. VENTILATOR. — Friedrich Keller, Milwaukee, Wis.

318,935. WOOD-FILLER. — Samuel F. Woodhouse, Philadelphia, Pa.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report thirty-five permits have been granted, the more important of which are the following: —

F. E. Yewell, 5 two-st'y brick buildings, e s Bruce Alley, n of Lanvale St.

C. A. Pindell, 5 two-st'y brick buildings, in rear of Mosher St., between Calhoun and Stricker Sts.; 5 two-st'y brick buildings, Calhoun St., between Tenant and Mosher Sts.; and 10 two-st'y brick buildings, n s Mosher St., n w cor. Calhoun St.

Jos. A. Eisenhardt, three-st'y brick building, n w s Gay St., between Mott and Aisquith Sts.

Trustees St. Gregory's Church, church-building, s w cor. Gilmor and Baker Sts.

M. Oppenheim, 2 three-st'y brick buildings, e s Pennsylvania Ave., between Biddle and George Sts., and 2 two-st'y brick buildings in rear.

J. Papplar, 5 three-st'y brick buildings (square), s s Baltimore St., s w cor. Choptauk St.

F. O. Singer, 8 two-st'y brick buildings, w s Carey St., between Patterson Ave. and Presstman St.

Jas. W. Tindall, three-st'y brick building, w s McKim St., n of Chase St.

McAfee Bros., 7 two-st'y brick buildings, e s Holbrook St., between Biddle and Preston Sts.

John Desch, three-st'y brick building, e s Charles St., cor. Oliver St.

John R. Bailey, 21 two-st'y brick buildings, e s Gilmor St., between Cole and Ramsay Sts.

Frederick Burger, 4 three-st'y brick buildings, e s Eden St., n of Eastern Ave.

L. Matthel, three-st'y brick building, n w cor. Hanover and Clement Sts.

Immaculate Conception Church, three-st'y brick building, n s Mosher St., between Druid Hill Ave. and Division St.

Benj. C. Bayne, 5 two-st'y brick buildings, w s Chester St., between McElderry and Monument Sts.

Boston.

BUILDING PERMITS. — *Brick.* — *Atlantic Ave., Nos.* 410–414. Otis Wharf, mercantile, 47′ x 88′; owner, Mrs. A. D. Barnard; builder, Chas. Doyle.

Washington St., No. 783, cor. Hollis St., mercantile, 51′ 6″ and 53′ x 49′ 2″ and 53′; owner, David W. Foster; builder, H. B. Rankin.

Kartopp St., No. 12, cor. Reeds Ct., dwell., 24′ 6″ x 38′ and 41′; owner and builder, C. A. Wetmore.

Tremont St., cor. Tremont Ct., water-fountain, 15′ x 15′; owner, Silas Gurney; builder, E. R. Rand.

Wood. — *Princeton St., Nos.* 142, 144, 146 *and* 148, 4 dwells., 21′ and 22′ x 33′ and 42′; owner and builder, G. W. Hargrave.

Brooks St., Nos. 127 *and* 129, 2 dwells.. 21′ x 33′ and 42′; owner and builder, G. W. Hargrave.

East Third St., near M St., dwell., 21′ x 33′; owner, J. L. Newcomb; builder, W. T. Eaton.

Dorchester Ave., near Bellour Pl., dwell., 19′ 6′ x 43′; owner, Mrs. A. H. McDonald; builder, Frank McDonald.

Dudley Ave., near Roslindale Ave., stable, 14′ x 20′; owner, John Kerrigan; builder, Joseph McDonald.

Fairview St., near South St., dwell., 21′ x 28′; owner, James Ryan; builder, Russell Park.

Ballinakill Ave., near Ashland St., dwell., 20′ x 23′; owner, John Higgins; builder, W. S. Mitchell.

Bainbridge St., near Kingsbury St., dwell., 22′ 8″ and 24′ x 54′ 8″; owner, Thomas Watson; builder, R. O. Dunn.

Brooklyn.

BUILDING PERMITS. — *Douglass St., Nos.* 897 *and* 899, 2 three-st'y brick tenements, tin roofs, wooden cornices; cost, each, $3,500; owner, John D. Ferguson, 917 Douglass St.; architect, Amzi Hill.

Third Pl., No. 12, s s, 140′ e Henry St., 2 two-st'y brown-stone dwells., tin roofs; cost, each, $4,000; owner and builder, Thomas Keogh, 149 Nelson St.

De Kalb Ave., No. 1213, n s, about 150′ e Bushwick Ave., two-st'y brick factory, tin roof; cost, $7,900; owner, T. De Witt & Son, 1211 De Kalb Ave.; architect, Frank Holmberg; builders, Ernst Loerch and John Rueger.

South Fourth St., No. 315, near Tenth St., four-st'y brick tenement, tin roof, wooden cornice; cost, $7,800; owner, Adam Schultz, 227 Grand St.; architect, Frank Holmberg.

Pacific St., n s, 150′ w Nostrand Ave., three-st'y brown-stone dwell., tin and slate roof; cost, $15,000; owner, George A. Betts, 1234 Pacific St.; architects, Geo. P. Chappell & Co.; builders, James Ashfield & Son and Morris & Selover.

Oakland St., Nos. 147, 147½ *and* 149, 3 two-st'y frame dwells., gravel roofs; cost, each, $2,500; owner, E. A Watken and J. Campbell; architect, Stephen Randall; builder, F. D. Sills.

Hart St., n s, 350′ w Marcy Ave., three-st'y brown-stone dwell., tin roof; cost, $9,500; owner, Chas. E. Watts, 64 Tenth St.; architect, E. F. Gaylor; builders, Matthew Smith and S. M. Weekes.

Myrtle Ave., s s, 325′ e Throop Ave., four-st'y brick tenement, tin roof; cost, $7,300; owner, B. T. Biffar, 516 Broadway; architect, E. F. Gaylor; builders, Mathew Smith and Jenkins & Gillies.

Water St., s s, 200′ e Jay St., 2 four-st'y brick tenements, tin roofs; cost, each, $6,000; owner, James Kerns, 114 Vanderbilt Ave.; architect, I. D. Reynolds; builders, Leahey & Moran and S. C. Whitehead.

Gates Ave., n s, 100′ e Reid Ave., 12 four-st'y brown-stone stores and dwells., tin roofs; cost, each, $9,000; owner and architect, Wm. Godfrey, 518 Monroe St.; builders, Wm. M. Gibson and Wm. Godfrey.

Conover St., n e cor. Sullivan St., four-st'y brick store and tenement, tin roof, wooden cornice; cost, $8,000; owner, William Woods, 240 Sullivan St.; architect and builder, C. M. Detlefsen.

Broadway, w s, 25′ n Stockton St., 2 three-st'y frame stores and dwells., tin roofs; cost, each, $3,900; owner and builder, George Loeffler, 78 Jefferson St.; architect, Frank Holmberg.

Broadway, w s, 65′ n Stockton St., three-st'y frame store and dwell., tin roof; cost, $4,000; owner and builder, Geo. Loeffler, 78 Jefferson St.; architect, Frank Holmberg.

Twelfth St., n s, 190′ w Seventh Ave., 3 three-st'y brick dwells., tin roofs; cost, each, $4,000; owner, A. G. Calder, 312 Twelfth St.; architect, Wm. M. Calder; builders, Jno. Wyeth and A. G. Calder.

Lafayette Ave., s s, 150′ w Clason Ave., two-st'y brick factory, gravel roof; cost, $4,000; owner, Edw. J. Hewitt, 49 Beekman St., New York; architects, Parfitt Bros.

Lafayette Ave., No. 1113, two-st'y and basement brick dwell., tin roof; cost, $6,000; owner, Mrs. Mari Ohle, 1021 Broadway; architect, H. Vollweiler; builders, George Cutler and H. Stocks.

South Ninth St., n s, 65′ w Eighth St., 3 four-st'y brick and brown-stone tenements, tin roofs; cost, each, $13,000; owner, E. Smith, Bedford Ave.; architect, W. H. Gaylor; builder, T. Gibbons.

Henry St., s e cor. Orange St., three-st'y and basement brick and brown-stone tenement; cost, $27,000; owner, Thomas Schloerb, 91 and 93 Orange St.; architect, E. W. Greis; builder, J. Thatcher.

Greenpoint Ave., s s, 75′ e Newell St., one-st'y frame depot and stable, gravel roof; cost, $5,000; owners, Calvary Cemetery and Greenpoint Railroad; architect, C. L. Smith; builders, G. & A. Langer.

South Fifth St., No. 79, n s, 75′ w Third St., four-st'y brick tenement, tin roof; cost, about $8,500; owner, W. R. Bell; architect and builder, C. A. Mushlit.

Greenpoint Ave., n s, *Nos.* 83 *to* 121, 21 four-st'y brick stores and dwells., gravel roofs; cost, each, $9,000; owner, James R. Sparrow, Greenpoint, L. I.; architect, E. B. Ackerly; builder, J. B. Woodruff.

President St., No. 825, 206′ w Eighth Ave., three-st'y brick dwell., tin roof; cost, $16,000; owner, Julia E. Woodford, 67 Cambridge Pl.; architect, H. O. Avery; builders, C. Cameron and W. S. Wright.

Leonard St., e s, 125′ n Calyer St., 2 three-st'y frame tenements, gravel roofs; cost, each, $9,500; owner, S. M. Saunders, Leonard St.; architect, F. Weber.

Gates Ave., n e cor. Sumner Ave., 6 four-st'y brick stores and tenements, gravel roofs; cost, each, $9,000; owner, M. E. Hall, 63 Patchen Ave.; architect, T. S. Godwin.

Kent Ave., e s, 25′ n Kosciusko Pl., three-st'y brick tenement, tin roof; cost, $5,500; owner, Thos. McCoy, on premises; architect, R. Dixon; builder, F. Fagan.

Manhasset Pl., e s, 110′ s Rapalyea St., 2 two-st'y brick dwells., tin roofs; cost, each, $3,000; owner, James Campbell, 6 Tiffany Pl.; architect, F. Ryan.

Chicago.

BUILDING PERMITS. — P. Popp, three-st'y store and dwell., 558 Halsted St.; cost, $12,000.

L. Strassheimer, two-st'y dwell., 1010 North Halsted St.; cost, $3,000.

J. Kohler, two-st'y dwell., 3009 Portland Ave.; cost, $2,500.

H. McGarrey, two-st'y dwell., 623 Harrison St.; cost, $2,600; architect, J. C. Zarbel.

F. Norotny, four-st'y stores and flats, Blue Island Ave. and Nineteenth St.; cost, $20,000.

M. Rech, three-st'y dwell., 240 Oak St.; cost, $7,000; architects, Schaub & Berlin.

T. Hoffman, basement, 115 Clybourne Ave.; cost, $2,500.

J. H. Doiz, two-st'y dwell., 465 Warren Ave.; cost, $2,800.

L. P. Smith, two-st'y dwell., 27 Bellevne Pl.; cost, $10,000.

M. Jalovy, two-st'y dwell., 102 Wesson St.; cost, $3,500.

Mrs. Trapp, two-st'y dwell., 28 Burling St.; cost, $4,000.

E. Deslefano, three-st'y store and dwell., 199 West Taylor St.; cost, $4,000.

Mrs. E. L. Potwin, three-st'y dwell., 391 Dearborn Ave.; cost, $7,000; architect, W. L. B. Jenney.

O. Cobb, alterations Hershey Music Hall, 81 to 87 Madison St.; cost, $15,000.

Mrs. C. Sperry, three-st'y flats, 307 Larrabee St.; cost, $3,500.

S. E. Barrett, 2 two-st'y dwells., 745 to 747 North Clark St.; cost, $12,000; architect, W. L. B. Jenney.

Wood Bros., three-st'y flats, 18 Twenty-sixth St.; cost, $3,500.

M. Gebel, three-st'y flats, 206 Rush St.; cost, $4,500.

Mrs. H. Cohn, three-st'y store and flats; cost, $9,000; architect, A. Bresler.

Geo. Birkhoff, Jr., two-st'y dwell., 575 West Adams St.; cost, $8,500; architect, J. F. Warner.

C. Gerhrke, four-st'y store and dwell., 453 Wells St.; cost, $5,500; architect, Schnoor.

W. H. Brett, three-st'y flats, 31 Adams St.; cost, $6,000; architect, J. Van Osdell.

L. & S. J. Arado, three-st'y store and flats, 84 Sherman St.; cost, $10,000; architect, W. F. Carroll.

Mrs. M. J. Harwood, 2 two-st'y dwells., 1919 Indiana St.; cost, $8,000; architect, W. A. Furber.

M. J. Chalmers, three-st'y dwell., 234 Ashland Ave.; cost, $20,000.

Thos. Meyer, four-st'y store and flats, 1029 Milwaukee Ave.; cost, $6,000; architect, C. P. Hanson.

N. P. Smith, 6 two-st'y dwells., 3237 to 3255 Cottage Grove Ave.; cost, $21,000.

R. Lancaster, three-st'y store and flats, 3269 Cottage Grove Ave.; cost, $6,000; architect, W. A. Furber.

St. Luke's Church Mission House, two-st'y Mission house, 388 Western Ave.; cost, $2,700.

O. B. Taft, one-and-one-half-st'y dwell., 3014 Michigan Ave.; cost, $7,000; architects, Wheelock & Clay.

Chas. Gehrke, two-st'y store and dwell., 139 Fullerton Ave.; cost, $5,000.

A. Kalb, three-st'y store and dwell., 485 West Madison St.; cost, $8,000.

C. Schroeder, 4 cottages, 997 to 1005 Hinman St.; cost, $4,000.

J. Wenzeler, two-st'y dwell., 3531 Dearborn St.. cost, $4,000.

Wm. Flagg, two-st'y rear addition, 1 Woodland Pk.; cost, $3,000.

J. Helland, three-st'y dwell., Michigan Ave.; cost, $12,000.

J. Totzke, 2 two-st'y stores and flats, 688 to 690 West Chicago Ave.

J. O. Callaghan, two-st'y flats, 683 Fulton St.; cost, $3,500; architect, C. Isaacson.

Cincinnati,

CHAMBER OF COMMERCE. — The competition for the new Chamber of Commerce closed on June 1, and fourteen sets of plans were received from which that of Mr. H. H. Richardson, of Brookline, Mass., has been selected for execution.

BUILDING PERMITS. — Richter & Co., four-st'y brick building, Ninth and Main Sts.; cost, $8.000.

Cincinnati Music Verein, four-st'y brick building, Twelfth and Walnut Sts.; cost, $20,000.

E. B. Meiner, four-st'y brick building, Vine and Marcy Sts.; cost, $4,600.

C. G. Vangandt, two-st'y brick building, 165 Barr St.; cost, $3,000.

F. Berger, three-st'y brick building, 80 Pleasant St.: cost, $3,000.

Wm. Gleme, four-st'y brick building, 266 West Fifth St.; cost, $3,500.

M. Warth, three-st'y stone front, Richmond and Cutler Sts.; cost, $10,000.

Mrs. J. Foster, four-st'y brick building, 268 West Fifth St.; cost, $12,000.

Total, $70,100.
Repairs, $12,010.
Total amount to date, $1,128,610.
Total permits to date, 340.

Cleveland.

Building Permits.—E. Quimby, brick block, Euclid cor. of Willson Ave.; cost, $50,000; A. M. Smith, architect; King & Grant, contractors.

Chas. Body, brick block, cor. Perry and Garden Sts.; cost, $11,000; Dantel & Giel, contractors.

Mr. Bruml, brick store and dwell., Garden St.; cost, $7,000; Uhl & Koestering, contractors.

L. F. & S. Burgess, brick block, Huron St.; cost, $35,000; J. M. Blackburn, architect; Thos. Simmons, contractor.

Atwater Estate, brick block, South Water St.; cost, $60,000; Brooks & Co., contractors.

Mr. King, brick block, Euclid Ave.; cost, $60,000; G. H. Smith, architect; Thos. Simmons, contractor.

Jacob Perkins, stone-front building; cost, $15,000; S. C. Kane, builder, Coburn & Baum, architects.

Thos. Lanter, brick block, Superior St.; cost, $50,000; Coöperative Building Co., builders; Cudell & Richardson, architects.

Addition to Stillman Hotel; cost, $45,000; Mr. Alexander, builder; A. Kochler, architect.

High Service Pumping Station for Cleveland Water Works (stone); cost, $90,000; John Whitelaw, superintendent and engineer; F. C. Bate, architect; A. Dall, Jr., contractor.

Miller & Rouse, brick block, Frankfort St.; cost, $14,000; S. C. Kane, builder; Levi Scofield, architect.

Infirmary Building; cost, $35,000; John Eisenman, architect.

F. C. Bate, frame dwell., Kennard Ave.; cost, $2,900; Flora & Hill, builders; F. C. Bate, architect.

Kansas City, Mo.

Building Permits.—E. Allison, three-and-one-half-st'y brick business block, 50′ x 110′, 1400 and 1402 Grand Ave.; cost, $22,700.

Peter Soden, three-and-one-half-st'y brick business block, 50′ x 112′, 12 to 22 East Eleventh St.; cost, $25,000.

E. C. Coleman, brick dwell., Central St.; cost, $3,500.

E. O. Moffat, brick dwell., Troost Ave.; cost, $5,000.

D. C. King, improvement of business property, 911 Main St.; cost, $5,000.

Biethen & Wheeler, four-st'y business block, 25′ x 142′, cor. Sixth and Central Sts.; cost, $20,000.

Mrs. I. L. Gibbs, brick business block, 421 West Sixth St.; cost, $7,000.

Jones & Diller, brick business block, 423 West Sixth St.; cost, $7,000.

New York.

Church.—The Episcopal Society of St. Edward the Martyr proposes to build on the s s of One Hundred and Ninth St., about 250′ e of Fifth Ave.

Flats.—For Mr. John H. Gray, two flats, one 26′ x 75′, one 20′ x 53′, are to be built on the n s of Eighty-Eighth St., 64′ e of Third Ave., from plans of Mr. I. B. McIntyre.

For Mr. Chas. Tillman, a 25′ front brick and stone flat, five stories high, is to be built at 312 East Eighty-second St., from plans of Mr. Chas. Kinkel.

Warehouse.—For Heywood Bros. & Co., a seven-st'y warehouse, 50′ x 120′, is to be built on Cherry St., running through to Water St., commencing 75′ e of Jefferson St. The cost of the new structure, which joins one previously built by the same company, will amount to $75,000.

Building Permits.—*Greenwich St., No.* 404, five-st'y brick tenement, tin roof; cost, $15,000; owner, Fred. C. Bliss, 1211 Park Ave.; architect, L. H. Broome.

Suffolk St., No. 22, five-st'y brick and brown-stone dwell., tin roof; cost, $10,000; owner, Philipp Happersberger, 49 South Third St., Brooklyn; architect, W. Graul.

Suffolk St., e s, 200′ n Rivington St., 2 five-st'y Nova Scotia stone tenements, tin roofs; cost, each, $18,000; owner, George A. Blessing, 102 West Twenty-first St., and Bartholomaus Sayer, 256 Broome St.; architect, W. Graul.

Barclay St., No. 69, four-st'y brick store, tin roof; cost, $8,000; owner, estate of G. W. Welsh, 111 East Fifty-seventh St.; architect, J. E. Ware.

Beekman St., No. 128, cor. Front St., five-st'y brick and terra-cotta store and lofts, tin roofs; cost, $17,000; owner, Ellen S. Auchmuty, Lenox, Mass.; architect, G. B. Post; builders, J. B. Smith and V. J. Hedden & Sons.

Norfolk St., No. 67, five-st'y brick tenement, tin roof; cost, $18,000; owner, Mrs. Amanda F. Bunting, 31 Madison Ave.; architect, J. Downing; builder, L. H. Williams.

Water St., Nos. 418 *to* 426, three-st'y brick cooperage repair-shop, tin roof; cost, $15,000; owner, Catharine Garrick, 671 Lexington Ave.; architect, J. H. Valentine; builder, J. C. Henry.

Fourteenth St., foot of West St., one-st'y frame ferry-house, tin roof; cost, $10,000; owner, W. W. Shippen, President, Seabright, N. J.; architect, C. B. Brush; builder, P. Hermann.

Broadway, Nos. 1392, 1394, 1396, 1398 *and* 1400, n e cor. Thirty-eighth St., 5 two-st'y brick stores and lofts, tin roofs; cost, each, $15,000; owners, R. & O. Goelet, 261 Broadway; architect, J. M. Dunn; builder, M. Reid.

West Thirty-eighth St., Nos. 117–123, five-st'y brick storage, tin roof; cost, $20,000; owners, architect and builder, same as last.

West Thirty-eighth St., No. 343, five-st'y brick tenement, tin roof; cost, $13,000; owner, Augustus Eichele, 341 West Thirty-eighth St.; architect, M. L. Ungrich; builder, days' work.

Thirty-eighth St., n s, 64′ e Eighth Ave., five-st'y brick apartment-house, tin roof; cost, days' work; owner, Henry Schwarzwalder, 310 West Fifty-eighth St.; architects, Thom & Wilson; builders, J. Vix & Son.

Fiftieth St., n s, 200′ e Madison Ave., five-st'y brick and brown-stone tenement, tin roof; cost, $50,000; owner, Rosanna Spaulding, 150 East Forty-sixth St.; architects, Thom & Wilson; mason, Jas. J. Spaulding.

Fourteenth St., n s, 235′ e Third Ave., 4 five-st'y brick and brown-stone tenements, tin roofs; cost, each, $20,000; owner, P. Henry Dugro, 34 Seventh St.; architect, F. W. Klemt.

East Twenty-seventh St., No. 228, five-st'y brick tenement, tin roof; cost, $14,000; owner, James Damery, 228 East Twenty-seventh St.; architect, J. Boekell.

West Twenty-seventh St., No. 330, five-st'y brick tenement, tin roof; cost, each, $17,000; owner, Henry C. Kegeler, 328 East Twenty-seventh St.; architect, O. Wirz; builder, not selected.

Twenty-ninth St., s s, 420′ e First Ave., one-st'y brick boilers and engine, tin roof; cost, $7,900; owner, U. S. Illuminating Co., 59 Liberty St.; builders, Berston & Nickel.

Ave. A, No. 1333, cor. Seventy-first St., five-st'y brick store and tenement, tin roof; cost, $16,000; owner, Jacob Kahrs, 319 First Ave.; architect, F. Jenth.

Madison Ave., e s, 76′ 8″ s Ninety-first St., 4 three-st'y brick and brown-stone dwells., tin roofs; cost, each, $13,000; owner, Andrew J. Kerwin, No. 1 River View Terrace; architect, A. B. Ogden.

First Ave., s w cor. Eighty-ninth St., 4 five-st'y brick stores and tenements, tin roofs; cost, each, $12,000; owners, Emeline and Elizabeth Johnston; architect, A. B. Ogden, 409 East Fifty-third St.

Fifth Ave., e s, 100′ s Eighty-first St., four-st'y brick and Belleville stone dwell., mansard, slate and tin roof; cost, $50,000; owner, Louis Stern, 32 West Twenty-third St.; architect, W. Schickel; builder, T. Kiernan.

Eighty-first St., n s, 53′ e Third Ave., four-st'y brick tenement, tin roof; cost, $8,500; owner, Edward G. Tinker, 29 East Fifty-seventh St.; architects and builders, Chas. Graham & Sons.

East Eighty-first St., No. 232, five-st'y brick tenement, tin roof; cost, $18,000; owner, T. W. Gilroy, 827 East Sixtieth St.; builder, J. Brandt.

Eighty-second St., s s, 127′ w Third Ave., five-st'y brick and brown-stone tenement, tin roof; cost, $18,000; owner, Samuel W. Waldron; architect, G. A. Schellenger.

Eighty-eighth St., s s, 37′ e Lexington Ave., 2 five-st'y brown-stone tenements, tin roofs; cost, each, $20,000; owner, Eliza Beaudet, 1437 Lexington Ave.; architect, J. H. Valentine.

Eighty-eighth St., s s, 106′ 6″ e First Ave., 8 five-st'y brick tenements, tin roofs; cost, each, $18,000; owners, Moore & McLaughlin, 240 East Seventy-first St.; architects, Thom & Wilson.

Eighty-ninth St., s s, 115′ w Third Ave., 2 five-st'y brick tenements, tin roofs; cost, $14,000; owner, Wm. B. Pope, 100 East Eighty-fifth St.; architect, G. C. Pope.

Ninety-first St., n s, 74′ 6″ w Lexington Ave., 6 three-st'y brick dwells., tin roofs; cost, each, $10,000; owner, John Weber, 1121 Madison Ave.; architect, same as last; builders, J. & L. Weber.

Cherry St., No. 417, five-st'y brick tenement, tin roof; cost, $15,000; Estate Bernard H. Hanigan, 196 East Seventh St.; architect, William Graul.

Ninth Ave., s e cor. Ninety-sixth St., five-st'y brick tenement, tin roof; cost, $16,000; James S. Briggs, 240′ w One Hundred and Thirty-fourth St.; architect, C. F. Ridder; builder, not selected.

Ninth Ave., e s, 21′ s Ninety-sixth St., five-st'y brick tenement, tin roof; cost, $18,000; owner, architect, etc., same as last.

Eighth Ave., s w cor. One Hundred and Thirtieth St., 4 five-st'y brick stores and tenements, tin roofs; cost, cor., $11,000; others, $13,000 each; Henry Gerkin, 1454 Third Ave.; architects, A. B. Ogden & Son.

One Hundred and Fifty-sixth St., s s, 425′ e Eleventh Ave., 3 four-st'y and three st'y and basement brick dwells.; cost, each, $4,500; Jacob and August Dux, 648 Eighth Ave., and 429 West Fiftieth St.; architect, Joseph Wolf.

One Hundred and Fifty-fifth St., s s, 180′ e Courtlandt Ave., three-st'y frame tenement, tin roof; cost, $4,000; Frederick Giese, 616′ e One Hundred and Fifty-third St.; architect and builder, E. Stichler.

Broome St., No. 12, five-st'y brick tenement, tin roof; cost, $12,000; owner and builder, David Christie, 413 West Fifty-seventh St.; architect, John F. Wilson.

Alterations.—*Fifth Ave., No.* 140, front altered, iron-work; cost, $5,000; Alfred Hearn and wife; architects, McKim, Mead & White; builder, Leonhard Hangen.

Sixth Ave., Nos. 604 *and* 606, add one st'y; also, five-st'y brick extension, tin roof; cost, $10,000; Wilhelmina Berls, on premises; architects, Thom & Wilson.

West Twenty-third St., No. 348, altered to first-class apartment-house extended, etc.; cost, $20,000; Benjamin F. Spink, 14 East One Hundred and Twenty-fifth St.; architect, C. H. P. Gilbert; builder, not selected.

West Fifty-sixth St., No. 53, two-st'y brick extension, tin roof, wooden partitions changed; cost, $6,500; Emanuel Lauer, on premises; architects, Brunner & Tryon.

Second Ave., n e cor. One Hundred and Twenty-fourth St., three-st'y and basement brick extension, tin roof, interior altered; also new store front, etc.; cost, $8,000; Fred. Sonneburg, 1043 Third Ave.; architect, J. Kastner.

Bowery, Nos. 45 *and* 47, raised 39′, altered for a theatre; cost, $30,000; Wm. A. Martin, 15 East Thirty-eighth St.; architect, L. H. Broome; builders, Robinson & Wallace and Richard Chidwick.

Philadelphia.

Building Permits.—*Stella Ave.*, cor. Emerald St., two-st'y dwell., 16′ x 35′; C. Harris, contractor.

Hope St., No. 1731, three-st'y dwell., 18′ x 30′; Jas. Quigley, contractor.

Franklin St., s of Lehigh Ave., 9 two-st'y dwells., 15′ x 42′; Jno. Loughran, owner.

Thirteenth St., n e cor. Locust St., addition to college-building, 55′ x 105′; R. Q. Gibbon, contractor.

Atlantic St., n of Dauphin St., 5 two-st'y dwells., 13′ x 28′; O. A. Scarlet, owner.

Seventh St., above Moore St., 5 two-st'y dwells., 16′ x 44′; T. C. Nesbitt, contractor.

Frankford Road, No. 2418, three-st'y dwell., 18′ x 85′; Geo. Kessler, contractor.

Coral St., cor. Columbia St., three-st'y dwell., 18′ x 40′; contractor, same as last.

Jefferson St., w of Division St., 2 three-st'y dwells., 18′ x 40′; P. Farley, contractor.

Preston St., s e cor. Westminster Ave., three-st'y dwell., 20′ x 75′; H. Grau, contractor.

Clearfield St., w of Broad St., 2 two-st'y dwells., 15′ x 40′; H. Miller, owner.

Twentieth St., s of Dickinson St., two-st'y dwell., 16′ x 43′; G. Lafferly, owner.

Twentieth St., above Tasker St., 2 two-st'y dwells., 16′ x 46′; Wm. Marshall, owner.

Porcelain St., w of Twentieth St., 3 three-st'y dwells., 17′ x 28′; Jno. Eisenman, contractor.

Deal St., cor. Adams St., 4 two-st'y dwells., 14′ x 42′; J. P. Gerkes, contractor.

Page St., e of Twenty-third St., 22 two-st'y dwells., 16′ x 48′; E. H. Flood, contractor.

Fontaine St., e of Twenty-third St., 11 two-st'y dwells., 16′ x 48′; contractor, same as last.

Columbia Ave., w of Broad St., three-st'y dwell., 18′ x 63′; H. H. Martin, contractor.

Emerald St., cor. Clementine St., 3 two-st'y buildings, 14′ x 40′; J. G. Baldt & Son, contractors.

Locust Ave., cor. Chew St., 6 three-st'y dwells., 17′ x 43′; Jas. Kinear Sons, contractors.

Fourth St., w s, s of Columbia Ave., factory, 52′ x 79′; J. B. Stetson, owner.

Kiehl St., below Amber St., 6 two-st'y dwells., 16′ x 26′; Geo. Miller, contractor.

Howard St., cor. Cumberland St., three-st'y dwell., 20′ x 58′; Daniel Neveling, contractor.

Garfield St., e of Wakefield St., two-st'y dwell., 16′ x 43′; G. W. Baxter, contractor.

Tacony St., near Tucker St., two-st'y dwell., 20′ x 46′; J. G. Taylor & Son, contractors.

Buckius St., near Locust Ave., 2 two-st'y dwells., 16′ x 29′; J. Tolson, contractor.

West College Ave., e of Twenty-fifth St., 40 two-st'y dwells., 14′ x 35′; C. W. Henry, owner.

Blockley Almshouse, dead-house, 35′ x 40′; G. Emory, contractor.

Fiftieth St., cor. Lancaster Ave., school-house, 64′ x 102′; M. J. McCloskey, contractor.

Venango St., w of Seventh St., 11 two-st'y dwells., 16′ x 50′; M. McIlvaine, owner.

Lombard St., w of Sixth St., two-st'y shop, 18′ x 40′; Ed. Ward, owner.

Lancaster Ave., w of Forty-sixth St., 2 two-st'y dwells., 18′ x 30′; B. Hoover, contractor.

Front St., below Arch St., five-st'y store, 28′ x 41′; Wendell & Smith, contractors.

Paul St., e of Frankford Road, 24 two-st'y dwells., 17′ x 42′; contractor, same as last.

Franklin St., s of Norris St., 14 three-st'y dwells., 15′ x 56′; W. H. Bilyne, owner.

Ginodo St., w of Eighteenth St., 11 three-st'y dwells., 14′ 6″ x 45′; B. Ketcham & Son, contractors.

Cedar St., cor. Terrace St., two-st'y dwell., 18′ x 42′; Thos. Haggerty, owner.

Twenty-second St., between Manton and Oakford Sts., 8 two-st'y dwells., 15′ x 42′; H. R. Coulombs, owner.

Twenty-eighth St., above Oxford St., 7 two-st'y dwells., 15′ x 40′; W. H. Lower, owner.

Penn St., cor. Allen St., dwell., 20′ x 35′; W. Milnor, contractor.

Wenton St., w of Eighth St., 19 two-st'y dwells., 13′ x 55′; H. McNeill, owner.

Lawrence St., n of Clearfield St., 16 two-st'y dwells., 15′ x 34′; P. McTague, contractor.

Orkney St., n of Clearfield St., 7 two-st'y dwells., 13′ x 34′; contractor, same as last.

Indiana Ave., w of Lawrence St., 6 two-st'y dwells., 15′ x 44′; contractor, same as last.

Queen St., near Thirty-fifth St., 8 two-st'y dwells., 15′ x 30′; H. J. Becker, owner.

Seventeenth St., s of Race St., two-st'y church, 45′ x 91′; F. Tweed, contractor.

Ridge Ave., cor. Parkers Ave., one-st'y wagon-house, 30′ x 35′; R. C. Pestor, contractor.

Franklin St., n of Huntingdon St., 7 two-st'y dwells., 12′ x 28′; Jacob Rightly, owner.

Thirtieth St., cor. Hartwell Ave., three-st'y dwell., 38′ x 58′; W. C. Mackey, contractor.

Highland Ave., near Germantown Ave., 2 three-st'y dwells., 17′ x 46′; contractor, same as last.

Hope St., cor. Huntingdon St., one-st'y building, 20′ x 30′; Geuttner, contractor.

Belgrade St., cor. Lehigh Ave., two-st'y brick building, 38′ x 63′; Moore & Sons, contractors.

Germantown Ave., above Bremer St., two-st'y store, 28′ x 50′; J. B. Minnich, contractor.

Sixteenth St., s of Berks St., 11 three-st'y dwells., 16′ x 56′; J. S. Serrill, owner.

Broad St., n of Butler St., three-st'y dwell., 39′ x 67′; W. McLaughlin, contractor.

Elizabeth St., n of Unity St., 2 two-st'y dwells., 13′ x 44′; A. T. Richards, contractor.

Fisher St., s of Lehigh Ave., two-st'y warehouse, 44′ x 130′; contractor, same as last.

Penn St., n w cor. Preston St., 7 three-st'y dwells., 17′ x 55′; E. L. Michaelson, contractor.

Sergeant St., w of Trenton Ave., 3 three-st'y dwells., 16′ x 32′; Jas. McNutt, contractor.

Maud St., e of Twenty-eighth St., 10 two-st'y dwells., 15′ x 39′; J. E. Ridgway, owner.

Tioga St., w of Nineteenth St., three-st'y dwell., 18′ x 57′; B. Walker, contractor.

Franklin St., n of Girard Ave., three-st'y dwell., 18′ x 57′; contractor, same as last.

Ogden St., between Liberty and Union Sts., 3 two-st'y dwells., 15′ x 44′; C. F. Hall, owner.

Union St., s of Ogden St., 5 two-st'y dwells., 16′ x 44′; contractor, same as last.

Oakford St., w of Twenty-second St., 4 two-st'y dwells., 16′ x 37′; Robt. Paul, contractor.

Broad St., s of Ellsworth St., three-st'y dwell., 20′ x 86′; Thos. Little & Son, contractors.

North Nineteenth St., Nos. 1730 *and* 1732, 2 three-st'y dwells., 17′ x 66′; Geo. Gillmora, contractor.

St. Louis.

Building Permits.—One hundred and eight permits have been issued since our last report, nine of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows:—

R. Albin, 4 adjacent two-st'y brick tenements; cost, $5,000.

Mrs. Kennedy, two-st'y double brick dwell.; cost, $3,500.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS.

BOTH the so-called Daly building-law and the law restricting the height of buildings have been signed by the Governor of New York, and are now in force in the city to which they apply. Concerning the Daly law we shall not venture to speak at present, the complete text, as finally amended and passed, not having been yet published, but, unless it has been materially changed from the original draft, it will be found, we think, much better suited than the old one to the varying conditions under which city buildings are now constructed. One important provision rescinds the law passed three or four years ago, which authorized the construction of wooden buildings on Manhattan Island north of One Hundred and Fortieth Street, and directs that no more frame buildings shall be erected south of One Hundred and Forty-ninth Street. We have repeatedly expressed our opinion that the State government made a mistake in relaxing the original regulations, which forbade the construction of any frame buildings on the island, and we hope that the new law will soon be so amended as to restore the earlier rule. The upper portion of Manhattan Island is so narrow that the progress of what may be called the normal building movement of the metropolis, which occupies entire streets, one after the other, with solid blocks of handsome brick or stone houses, has now become very rapid, and the mean wooden structures which the law of three or four years ago propagated like mushrooms in the region between One Hundred and Fortieth and One Hundred and Fiftieth Streets will soon be enveloped in masses of first-class buildings, whose value they will diminish as much by their shabby appearance as by the danger of fire to which they expose everything about them. The removal of the authorized limit from One Hundred and Fortieth to One Hundred and Forty-ninth Street really does nothing to improve matters, if, indeed, it does not aggravate the inconveniences and dangers incident to the operation of the old law. As it happens, the region about One Hundred and Fifty-second Street has long been thickly settled, and, under the name of Carmansville, or Washington Heights, has taken something such a place as that which Harlem and Manhattanville occupied in relation to New York twenty years ago. Harlem and Manhattanville, which, at the close of the war, were pleasant suburban towns, have long been swallowed up by the advancing tide of the city, and are as much a part of the great metropolis as the Bowery, which many people can remember as a shady village road; and when the same fate overtakes the beautiful little gardens of Washington Heights, as it must before long, every cheap wooden building will stand for so much capital, not perhaps unproductively invested, but representing an injury to the value of the surrounding estates which would pay for it twice over. It is needless to say that the persons who take advantage of these provisions for frame buildings are not the poor workingmen in whose interest they are ostensibly devised, but speculators, who crowd their cheap structures close to the legal limit, with the idea of offering their houses in competition with the brick ones just below, and securing, at paying prices, tenants who care less for the substantial character of their dwellings than for the saving of a few dollars in rent; and hardly anything worse could happen to the property-owners of Washington Heights than to have their portion of the city filled up, to the exclusion of the better class of buildings, with such structures as those which for so many years kept respectability and decency out of the region extending from the Five Points to Houston Street and Broadway.

CONCERNING the value of the other law, restricting the height of dwelling-houses to seventy feet, there are, very naturally, many opinions. It is noticeable that the New York newspaper which found the most to commend in the measure before it was passed is edited and published in one of the loftiest buildings in the city, and we venture to predict that the persons who now own flats or apartments so high above the adjoining houses as to enjoy sunshine and prospect over their neighbors' estates will be found, to a man, enthusiastic advocates of the new law, which, of course, preserves to them for an indefinite period the privileges which they have already secured. So far as the appearance of the city is concerned, there can be no doubt that the prohibition of ten-story apartment houses will be beneficial. As now constructed, they admit of few pleasing architectural effects, while they efface, so to speak, the buildings of ordinary size about them. Whether they shade the streets in front of them to an objectionable degree or not is less certain; but we are becoming so accustomed to vast open spaces in our cities that anything which casts a shadow across the street seems to us a grievance, and we forget all about the advantages of the shelter which goes with the shade, and which New York streets need so much in winter.

MR. MILNE, the Professor of Engineering in the Imperial College of Tokio, in Japan, has employed his leisure moments in making some important observations in regard to the effects of earthquakes, which are very common in that country. The occasion of his first experiments seems to have been his appointment as designer of certain lighthouses for the Imperial Government. It is necessary that the lamps of a lighthouse should be as steady as possible, and as an aid in devising means for lessening the effect of vibrations of the earth, he set himself to ascertain the character of the movements to be counteracted. By comparison of observations recorded simultaneously at several stations, he found that the effect of an earthquake shock, at least in that region, resembles very closely, as he says, that of the explosion of a torpedo under water. Just over the centre of disturbance there is a strong vertical movement, which changes to a lateral vibration as the earthquake propagates itself in all directions, something as the vertical jet of water thrown up by a torpedo dies away outwardly into circles of surface undulations. Like the waves of a submarine explosion also, the lateral earthquake movements are found to be quite superficial, the vibrations at the bottom of a pit ten feet deep being only one-sixth as great as on the surface close by, while they seem to follow certain lines, which are fixed for each locality, the instruments at one of Professor Milne's stations, for instance, always registering about six times as much movement as those at the other stations near by.

TO protect a building against the effect of a vertical movement of the earth under it is a difficult matter, but this sort of motion takes place over such limited areas that the lateral vibration is in practice the principal one to be guarded against. Our readers know already how the Japanese steady their pagoda towers, by hanging from the apex of the roof a pendulum of heavy timber; and Professor Milne found that they protect also their lighter buildings to a certain extent against dislocation by putting under them, in place of piers, rounded boulders, which roll slightly on their beds, and thus absorb the lateral movement of the ground, instead of transmitting it to the building above. Acting upon this suggestion, Professor Milne rested the lamp-chamber of his first light-house on cannon-balls, which allowed it to roll freely within certain

limits; but the movement was found to take place with so much facility that the wind would shift the structure to an annoying extent, and the system was modified in the towers subsequently built by placing a large number of cast-iron shot, about a quarter of an inch in diameter, under the foundations. This device seems to have answered its purpose very well, and is well worth remembering by those who may have occasion to build either light or heavy buildings in earthquake countries. In regard to the effects which earthquakes may be expected to produce upon buildings not so protected, Professor Milne's observations are very instructive. The two classes of structures which he found to bear such shocks best were stone buildings, very heavy and very strongly bonded, and light framed buildings of wood, whose elasticity enabled them to recover from the vibration imparted to them. Those most affected were buildings constructed partly of wood and partly of masonry, as framed houses with brick chimneys. Here the movement of the masonry was so different from that of the wood-work that neither gave any support to the other, and the masonry generally fell first, bringing down with it the surrounding framing.

THAT most energetic of professional associations, the Société Centrale des Architectes, has set the example of establishing a permanent commission, charged with the duty of considering all questions which may be brought before it relating to competitions, and of giving information and advice on matters connected with this subject, not only to architects, but to building-committees, public bodies, societies or private individuals, for whom programmes and terms of competition will be prepared, juries selected, and prizes arranged. The commission consists for the present year of M. Questel, the President of the Société Centrale, and one of the three or four most distinguished architects in France, MM. Hermant, Labrouste and Wallon, Vice-presidents and Secretary of the society, MM. Alphand and Poulin, the official directors of public building operations, and twenty other architects, among whom are MM. Andre, Ballu, Garnier, Ginain, Vaudremer, Daumet, Guillaume, Normand, Pascal, Raulin, Hénard and Sedille, besides others of equal distinction in their own country, but perhaps less known here. Every member of the Commission has the star of the Legion of Honor printed after his name, and eight are members of the Institute of France, so that their opinions and decisions will certainly carry with them all the weight that high public and professional position can bestow. Notwithstanding the multiplicity of the duties which usually press upon men of this class, the members of the Commission have accepted their new charge with something like enthusiasm, and invite all who wish for their help or counsel to apply to them freely, promising to use prompt, earnest efforts in their behalf. It is difficult to see how a greater service than this could be rendered by the older and more distinguished members of the profession to their younger brethren; and as *La Semaine des Constructeurs* says of the Society of Mutual Defence, the plan of which originated among the same men, the more honor should be rendered them for their devotion to the common interest, for the reason that, personally, they have nothing to gain by it, their position securing them already against the injustice from which they wish to protect others.

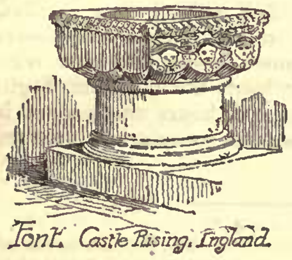
MOST of our readers have probably heard something about the inoculation which Dr. Ferran, of the province of Valencia, in Spain, has been practising of late as a preventive of cholera. Valencia is at present the scene of a very violent epidemic of cholera, and nearly two thousand persons have, we believe, submitted to the Ferran treatment, with results so far satisfactory that only a small percentage of those inoculated have been subsequently attacked with cholera, and few, if any, of those attacked have died. At the same time, cholera being, unlike small-pox, a disease which may occur any number of times in the same subject, and Dr. Ferran's artificial symptoms being rather unlike those of real cholera, there is some reason for believing that his inoculation produces nothing but mild blood-poisoning instead of an artificial and protecting form of cholera, and that the immunity which it appears to give against the attacks of the epidemic is partly due to the moral effect of the confidence felt by those who have undergone the operation, although even ordinary blood-poisoning may for a time enable the system to resist the attacks of the cholera infection. As now practised, according to the *Sanitary Engineer*, Dr. Ferran's inoculation consists in the introduction, generally into the lower arms, of small quantities of liquid containing a modified form of Koch's cholera bacillus, produced by the ordinary modes of culture. After a few hours the arms swell, and pains and nausea occur, attended with cramps and fever. In twenty-four hours the symptoms begin to abate, and at the end of forty-eight hours the patient is generally as well as ever; and subsequent inoculations produce no further effect upon him.

WE learn from the *Scientific American* that the Empress of Germany, who has long been distinguished for her intelligent interest in sanitary matters, offers a prize of one thousand dollars in gold and a gold medal for the best design for a movable "ambulance barrack," by which appears to be meant a small, portable hospital. The structure must be so planned that it can be used on the battle-field, or as an isolating ward during epidemics, or can, if required, be connected with others as a part of a larger hospital. As a building, the structure must be substantial and warm for winter use, but it must be so designed that it can be readily taken down, packed in small compass, and set up in a new place without the aid of skilled labor. Provision must be made for heating and for ventilation in winter, when the doors and windows are shut, and the walls and floors must be capable of thorough and easy disinfection without injuring them. The "barrack" must be long enough to accommodate twelve beds, allowing at least twelve cubic metres of space to each bed. Competitors are required to submit floor-plans, and transverse and longitudinal sections of their designs, at one twenty-fifth the full size, with details of the modes of construction, of heating and ventilation, and of the arrangement of water-closets, which may be either attached to the building or isolated. Detail drawings are to be at either one-fifth or one-tenth the full size, and the places for the beds must be shown on the plans. With the drawings must be submitted a description and approximate estimate, written in French, German, English and Italian. Those who enter for the prizes must submit, in addition to the rest, a model of the building at one-fifth the full size; but honorable mention may be given to those who represent their designs by drawings and descriptions only. Persons who intend to compete are required to send notice of their intention before the fifteenth of July to the "Commissariat-General," 10a Rue de la Loi, Brussels, Belgium, and further information is to be obtained by addressing the International Committee of the Red Cross, Geneva, Switzerland.

LA SEMAINE DES CONSTRUCTEURS gives an account of an ancient house recently discovered at Rome, in the Via Statuto. The structure is considered to date from the fourth century, and contains only two rooms on the ground floor, ornamented with stucco and wall paintings in bad condition. A little stair, however, leads to an underground passage, opening into a room in which was found, when the house was opened, a marble table supporting a statue of a youth slaying a bull, the common representation, as it appears, of the Persian god, Mithras. In front of the idol still lay upon the table a wooden stick, with seven nails in it, on which were stuck the candles which the pagans were accustomed to burn on certain occasions to the seven planets, and several lamps of the common pattern of the fourth century were disposed around. By the side of the room in which the idol stood was a bath-room. The passageway at the foot of the stairs was blocked with stones, and it is supposed that the inhabitants of the house, fearing the displeasure of the Christians, who were then in full possession of the Roman government, first constructed this sanctuary for the unobserved worship of their deity, and then, finding themselves either compelled to leave their homes, or in danger of hostile visitation, took the precaution of barricading the passage, to prevent the invasion of the sacred place. It is known that a tradition existed among the pagans of that time that the Christian religion would endure only three hundred and sixty years, and this is not the first instance in which idols dating from about the same period have been found installed in concealed or inaccessible rooms, waiting for the revolution which should again bring them and their worshippers into honor.

THE NEW MECHANICS' LIEN LAW OF NEW YORK.

TEXT OF THE BILL JUST SIGNED BY GOVERNOR HILL.



Font. Castle Rising. England.

AN ACT for the better security of mechanics, laborers and others who perform labor or furnish material for buildings and other improvements in the several cities and counties of this State, and to repeal certain acts and parts of acts. Passed May 27, 1885.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. Any person or persons, firm or firms, corporation or association, who shall hereafter perform any labor or service, or furnish any materials which have been used or which are to be used in erecting, altering or repairing any house, wharf, pier, bulkhead, bridge, vault, building, or appurtenances to any house, building or building lot, including fences, sidewalks, paving, fountains, fish-ponds, fruit and ornamental trees, with the consent of the owner, as hereinafter defined, or his agent or any contractor or sub-contractor, or any other person contracting with such owner to erect, alter or improve as aforesaid, within any of the cities or counties of this State may, upon filing the notice of lien prescribed in the fourth section of this act, have a lien for the principal and interest of the price and value of such labor and material upon such house, wharf, piers, bulkheads, bridges, vault, building or appurtenances, and upon the lot, premises, parcel or farm of land upon which the same may stand or be intended to stand to the extent of the right, title and interest at that time existing of such owner, whether owner in fee of a less estate, or whether a lessee for a term of years, or vendee in possession under a contract existing at the time of the filing of said notice of lien or of the owner of any right, title or interest in such estate which may be sold under an execution under the general provisions of the statutes in force in this State relating to liens of judgment and enforcement thereof, and also to the extent of the interest which the owner may have assigned by a general assignment for the benefit of creditors within thirty days prior to the time of filing the notice of lien specified in the fourth section of this Act. But in no case shall such owner be liable to pay, by reason of all the liens filed pursuant to this act, a greater sum than the price stipulated and agreed to be paid in such contract and remaining unpaid at the time of filing such lien, or in case there is no contract than the amount of the value of such labor and material then remaining unpaid, except as hereinafter provided.

SEC. 2. If the owner or such person in interest as aforesaid, of any house, wharf, pier, bulkhead, bridge, vault, building or appurtenances, for or toward the construction, altering, repairing or improvement of which, labor and service have been performed or materials have been furnished by contract, whether oral or written, shall, for the purpose of avoiding the provisions of this act or in advance of the terms of any contract, pay by collusion any money or other valuable thing on such contract, or give a mortgage or make any other lien or incumbrance upon said house, wharf, vault, building or appurtenances, lot, premises, parcel or farm of land upon which the same may stand or be intended to stand, or said improvement shall be made, and the amount still due or to become due to the contractor, sub-contractor or assignee after such payment has been made, shall be insufficient to satisfy the claims made in conformity with the provisions of this act, the owner or other person in interest as aforesaid, shall be liable to the amount that would have been unpaid to said contractor, sub-contractor or assignee, had said owner or other person in interest made no such payment or given no such mortgage, or effected no such lien or incumbrance, at the time of filing the notice of lien prescribed in the fourth section of this act, in the same manner as if no such collusive payment, mortgage, lien or incumbrance had been made, given or effected.

SEC. 3. Any person or persons, firm or firms, corporation or association, performing any labor, or service, or furnishing any materials for any of the purposes specified in the first section of this Act, to or for any person other than the owner, may at any time demand of such owner or of his authorized agent, the terms of the contract or agreement by which said house, wharf, pier, bulkhead, bridge, vault, building or appurtenances is being erected, altered, repaired, or improvements made to any such house, building or building lot, and the amount due or unpaid the person or persons, firm, corporation or association, erecting, altering, repairing or improving the same; and if such owner or his said agent at the time of said demand shall neglect or refuse to inform the person making such demand of the terms of the contract or agreement under which the same are being erected, altered, repaired or made, and the amount due and unpaid upon such contract or agreement therefor, or shall intentionally and knowingly falsely state the terms of said contract or agreement, or the amount due or unpaid thereon; and if the person, persons, firm or firms, corporations or associations furnishing such materials or performing such labor or service, shall sustain loss by reason of such refusal or neglect or false statement, the said owner shall be liable to them in an action therefor and the return unsatisfied of an execution against the party to whom such materials were furnished or for whom such labor and service were performed, in an action for the collection of the value thereof, shall be presumptive proof of such loss, and the person or persons, firm or firms, corporation or association furnishing such materials or performing such labor and service or making such improvement, shall by filing the notice of lien within the time and in the manner prescribed by this act, have a lien upon the house, wharf, vault, pier, bridge, bulkhead, building or appurtenances, and upon the lot, premises, parcel or farm of land upon which the same may stand or be intended to stand, or improvement is made, as in this act provided, for all the materials furnished and labor and service performed after such neglect, refusal or false statement.

SEC. 4. At any time during the performance of the work or the furnishing of the materials, or within ninety days after the completion of the contract, or the final performance of the work, or the final furnishing of the material for which a lien is claimed, dating from the last item of work performed or from the last item of material furnished, the person or persons, firm or firms, corporation or association furnishing such materials or performing such labor or service, may file a notice of a lien in writing in the clerk's office in the county where the property is situated against which the lien is asserted, containing the names and residences of the claimants, the nature and amount of the labor and service performed, or the materials furnished or to be furnished, with the name of the owner, lessee, general assignee, or person in possession of the premises against whose interest a lien is claimed; the name of the person or persons, firm or firms, corporation or association by whom he was employed, or to whom he furnished or is about to furnish such materials, or whether all the work for which the claim is made has been actually performed or furnished, and if not, how much of it, and also a description of the property to be charged with a lien sufficient for identification, and if in a city or village the situation of the building or buildings by street and number, if the street and number be known. But the failure to state the name of the true owner, lessee, general assignee, or person in possession, shall not impair the validity of the lien. The said notice of lien must be verified by the person or one of the persons, member of a firm or firms, an officer of the corporation or association making the claim or his, its or their agent, to the effect that the statements therein contained are true to the knowledge or information and belief of the person making the same. The county clerk of each county shall provide and keep a book in his office to be called the "lien docket," which shall be suitably ruled in columns headed "claimants," "against whom claimed," "owners and parties in interest," "premises," "amount claimed," in which he shall enter the particulars of such notice of lien together with the date, hour and minute of filing of the notice of lien, and what proceedings have been had, the names of the owners and persons in interest, and other persons against whom the claims are made shall be entered in said book in alphabetical order. A fee of twenty cents shall be paid to said clerk on filing such notice of lien. Every claimant shall, within ten days after filing his notice of lien as herein provided, serve a copy of such notice upon the owner, or other person in interest by delivering the same to him personally, or by leaving a copy thereof at his last known place of residence in the city or town in which such lands or part thereof are situated, with some person of suitable age and discretion, or if such owner or person in interest has no such residence, or such person cannot be found, by affixing a copy thereof conspicuously on said premises described in said notice of lien, between the hours of 9 o'clock in the morning and 4 o'clock in the afternoon. And after such service such owner or the person in interest shall not be protected in any payment made to such contractor or other claimant.

SEC. 5. The liens provided for in this act shall be preferred as prior liens to any conveyance, judgment or other claim which was not docketed or recorded at the time of filing the notice of lien prescribed in the fourth section of this act, and prior to advances made upon any mortgage on the premises after filing of such notice of lien, and prior to the claim of any creditor who has not furnished materials or performed labor upon any land, or towards the erection or improvement of premises, described in said notice of lien and which have been assigned by the owner, lessee, or person in possession thereof, by a general assignment for the benefit of creditors within thirty days before the filing of the notice of lien provided for in the fourth section of this act. But nothing in this act shall affect the priority of the amount actually owing on a mortgage given for purchase-money. In cases in which the owner has made an agreement to sell and convey the premises to the contractor or other person, such owner shall be deemed to be the owner within the intent and meaning of this act, until the deed has been actually delivered and recorded, conveying said premises pursuant to such agreement.

SEC. 6. No lien provided for in this act shall bind the property therein described for a longer period than one year after the notice of lien has been filed, unless within that time an action is commenced to enforce the same; and if the action is in a court of record, a notice of the pendency of such action is filed with the county clerk of the county in which such notice of lien is filed, containing the names of the parties to the action, the object of the action, and a description of the premises affected thereby, and the time of filing the notice of lien. Or unless an order be made by a court of record continuing such lien, and a new docket be made stating such fact. And when a claimant is made a party defendant to any action brought to enforce any other lien, such action shall be deemed an action to enforce the lien of such defendant, who is a claimant within the provisions of this act. The neglect to file the notice of pendency, provided for by this act, shall not abate any action which may be pending to enforce the lien, but such action may be prosecuted to judgment against the person or persons, firm or firms, corporation or association liable for the debt.

SEC. 7. Any claimant who has filed the notice of lien mentioned in the fourth section of this act, may enforce his claim against the property therein mentioned, and against the person or persons, firm or firms, corporation or association, liable for the debt, by a civil action in a court of record in the city or county where the property is situated, which would have jurisdiction to render a judgment in an action founded upon a contract, for a sum equal to the amount of the lien.

SEC. 8. The manner and form of instituting and prosecuting any such action to judgment, or an appeal from such judgment shall be the same as in actions for the foreclosure of mortgages upon real property, except as herein otherwise provided. A certified copy of the notice of lien filed, as herein provided, shall be entitled to be read in evidence, with the same force and effect as if the original were provided, and such copy shall be *prima facie* evidence of the execution and filing of the original.

SEC. 9. An action to foreclose a lien, provided for in this act, may be brought in a court not of record, which would have jurisdiction to render a judgment in an action upon a contract for a sum equal to the

amount of the lien, and shall be commenced by the personal service anywhere within this State, of a summons and a complaint verified according to the provisions of Section Five Hundred and Twenty-Six of the Code of Civil Procedure, upon the owner or other person in interest as described heretofore in this act. The complaint must set forth substantially all the facts contained in the notice of lien filed with the clerk of the county as provided in Section Five of this Act, and the substance of the contract. The form and contents of the summons shall be the same as prescribed by the Code of Civil Procedure for the commencement of an action in a court not of record. The summons must be returnable not less than twelve nor more than twenty days after the date when it is issued.

SEC. 10. When the summons in an action in a court not of record cannot be served personally on the owner or party in interest, by reason of absence from the State or concealment therein, such service may be made by leaving a copy of such summons at the last place of residence of such owner or person in interest, as aforesaid, and by publishing a copy of such summons for three weeks in succession in a newspaper published in the city or county where the property is situated. If the service of the summons is made by publication, the time when said summons is returnable shall commence to run from the day of the last publication.

SEC. 11. At the time and place specified in the summons for the return thereof, issue must be joined if both parties appear, by the owner or other person in interest filing with the justice an answer in writing verified as herein provided for verifying the complaint, and which may contain a general denial of each allegation of the complaint or a specific denial of one or more of the material allegations thereof; it may also set forth any legal or equitable defense or counter-claim to such complaint. If the owner or other party in interest fails to appear on the return day of the summons on proof by affidavit of the service of the summons and complaint, if personal service thereof be made, or if by publication or proof of the service of summons by advertisement, judgment may be entered for the amount claimed in the complaint with the costs; execution may thereupon be issued for the collection of said judgment and costs, the same as upon judgments in actions on contract in such courts, except that the execution shall direct the officer to sell the right, title and interest of the owner or other person in interest as aforesaid in the premises, upon which the claim set forth in the complaint was a lien at the time of filing the notice of lien prescribed in the fourth section of this act.

SEC. 12. The issue joined as provided in the preceding section, must be tried the same as other issues are tried in the respective courts in which the action is brought, and the judgment thereon be enforced; if for the claimant as provided in the preceding section, if for the owner or other person in interest it must be enforced the same as in actions arising on contracts in the respective courts.

SEC. 13. Appeals may be taken from such judgments rendered in courts not of record, in the same manner and according to the same provisions provided by statute for appeals from judgments in actions in such courts arising on contract for the recovery of money only.

SEC. 14. Costs and disbursements, except in courts not of record, in which they shall be the same as allowed in civil actions in such courts, shall rest in the discretion of the court, and may be awarded to or against the plaintiff or plaintiffs, defendant or defendants, or any or either of them as may be just and equitable except as provided in Section Nineteen of this Act, and shall be included in the judgment recovered therein. The expenses incurred in serving the summons by publication may be allowed in courts not of record, and added to the amount of costs now allowed in said courts. When an action is brought in a court of record such direction shall be made in the discretion of the court, as to the payment of costs as shall be just and equitable, and the judgment entered shall specify to whom and by whom the costs are to be paid.

SEC. 15. Whenever in any action brought under the provisions of this act, any claimant shall fail, for any reason, to establish a valid lien, he may nevertheless recover therein judgment against the party or parties to the action for such sum or sums as may appear to be due to him, and which he might recover in an action upon a contract against the said party or parties.

SEC. 16. A transcript of every judgment rendered under and according to the provisions of this act headed "lien docket," shall be furnished by the clerk of the county where rendered and docketed to the successful party, who may file the same with the clerk of any other county, and if the judgment is for twenty-five dollars or upwards, exclusive of costs, the same shall thereafter be a lien on the real property in the county where the same is filed and docketed of every person against whom the same is rendered, in like manner and to the same extent as in other actions for the recovery of money arising on contracts. When the action is tried and the judgment rendered in a court not of record, the justice of the court in which the action is tried, or other person authorized to furnish transcripts of judgments therein shall furnish the successful party a transcript thereof, who may file the same with the clerk of the county with whom the notice of lien is filed. The filing of such transcript shall have the same effect as the filing of transcripts of judgments rendered in such courts not of record. In all cases where the judgment is against the claimant or claimants the county clerk shall enter the word "discharged" under the last head in his lien docket.

SEC. 17. Any person or persons, firm or firms, corporation or association, filing a notice of lien, or the assignee of such person or persons, firm or firms, corporation or association, after the filing thereof, shall be the plaintiff in such action. The plaintiff must make the parties who have filed notice of liens against the property as well as those who have subsequent liens and claims by judgment, mortgage or conveyance, parties defendant. And as to all persons, firms, corporations or associations against whom no personal claim is made the plaintiff may with the summons serve a notice stating briefly the object of the action, and that no personal claim is made against it or them. And all persons, firms, corporations or associations, who have filed notice of liens under this act shall by answer in such action set forth the same, and the court in which the action is brought may settle and determine the equities of all the parties thereto, and decide as to the extent, justice and priority of the claims of all parties to the action and upon every counter-claim or set-off alleged therein, to the extent of their respective jurisdictions. The provisions in this section in regard to making parties who have filed notices of liens against the property as well as those who have subsequent liens and claims by judgment, mortgage or conveyance, parties defendants shall not apply to proceedings to enforce liens instituted in courts not of record.

SEC. 18. Any persons, firms, corporations or associations claiming liens upon the same property may join in the same action, and when separate actions are commenced the court in which the first action was brought may, upon the application of the owner of the property, or of any part thereof, or of any party to either action, consolidate them. The provisions of this section shall not apply to actions commenced in courts not of record.

SEC. 19. At any time after an action is commenced, the owner or owners of the property affected, may, in writing, offer to pay into court any amount stated in the offer, or to execute and deposit any securities or papers which he may describe, in discharge of the lien or liens. If the offer is accepted in writing within ten days thereafter, the court in which the action is pending may make an order that on executing and depositing with the clerk of the county the amount offered or the securities or papers described, the lien or liens be discharged and the moneys or securities deposited take the place of the property upon which such lien or liens was or were created, and shall be subject to the same. In case the offer shall not be accepted within ten days, and the plaintiff fails to recover any more favorable judgment against the property, he shall pay any cost in the action incurred by the owner from the time of the offer.

SEC. 20. All persons, firms, corporations, or associations entitled to liens, under the provisions of this act, except those who contracted with the owner, shall be deemed sub-contractors, and the court in the judgment shall direct the amount due sub-contractors to be paid out of the proceeds of sales, before any part of such proceeds are paid to the contractor. In case of several buildings erected, altered or repaired under one contract and of conflicting liens, each lienor shall have priority upon the particular building or premises where his labor is performed or his material used. Persons standing in equal degree as co-laborers or various persons furnishing materials shall have priority according to the date of filing their liens. Where several notices of liens are filed for the same demand, as in case of a contractor including claims for workmen to whom he is indebted, and the lien by the workmen, the judgment shall provide for the proper payment, so that, under the liens filed, double payment shall not be required. And no payments voluntarily made upon any claim which has been filed as a lien shall impair the lien of any person except the lien of the person so paid to the amount of such payment.

SEC. 21. In every case in which different liens are asserted against property, the court in the judgment must declare the priority of each lien, and the proceeds of the sale of the property must be applied to each lien in the order of its priority.

SEC. 22. Whenever, by the terms of his contract, the owner has stipulated for the delivery of bills, notes or other obligations or securities, or of any other species of property in lieu of money, the judgment may direct that such substitute be delivered or deposited as the court may direct, and the property affected by the liens can only be directed to be sold in default of the owner to deliver said substitutes within such time as may be directed.

SEC. 23. Whenever, on the sale of property against which a notice of lien is filed as provided in the fourth section of this Act, there is a deficiency of proceeds, judgment may be docketed for the deficiency against the persons, firms, corporations or associations named in the judgment as personally liable therefor, and therein adjudged to pay the same in like manner and with like effect as in actions for the foreclosure of mortgages. The provisions of this section shall not apply to actions commenced in courts not of record.

SEC. 24. A lien may be discharged as follows:

1. By filing a certificate of the claimant or his successor in interest, duly acknowledged or proved, stating that the lien is satisfied and may be discharged.

2. By depositing with the county clerk, if before the suit, of a sum of money equal to the amount claimed, with interest to the time of such deposit.

3. After the commencement of the action, by the deposit with the clerk of the county of such sum of money as in the judgment of the court, after due notice to all claimants or parties to the action, will be sufficient to pay any judgment which may be recovered against the property. In case the deposit of money is made with the county clerk as provided in subdivisions two and three of this section, the same shall be repaid by said clerk to the party making such deposit, or his assigns, upon the lien or liens being discharged by the claimants who have filed a notice or notices of lien or liens.

4. By the lapse of time. When one year has elapsed from the time of filing the notice of lien, and no action has been commenced either to enforce such claim or order of the court made continuing said lien, as provided in Section Six of this Act.

5. By order of the court for neglect of the claimant to prosecute the same as hereinafter provided. The owner of the property or of any part thereof affected by and notice of lien filed under this Act or the person or persons, firms, corporations or associations against whom the claim is made, may, at any time after the filing of the notice of lien, serve a notice in writing upon the claimant or any one of several claimants united in interest, or by leaving such notice at his last known place of residence, with some person of suitable age, with direction to deliver the same, requiring said claimant to commence an action to enforce the claim within the time to be specified in the notice, which shall not be less than thirty days from the time of such service; or to show cause at a special term of any court of record, at which a motion might be made in an action to enforce the lien or at a county court of the county in which the property is situated at a time to be specified in

such notice, why the notice of lien filed should not be vacated and cancelled of record. Thereupon, upon due proof of the service of said notice, and that no action has been commenced to enforce the claim, the court may make an order that the claim be vacated and cancelled of record.

6. By the owner of the premises, person or persons, firm or firms, corporations or associations against whom or which the notice of lien is filed, executing with two or more sufficient sureties, who shall be freeholders, a bond to the clerk of the county where the premises are situated, in such sum as the court may direct, not less than the amount claimed in said notice, conditioned for the payment of any judgment which may be rendered against the property. The sureties on said bond must justify in at least double the sum named in the said bond. A copy of the said bond, with a notice that the sureties will justify before the court or a judge thereof, at the time and place therein named, not less than five days thereafter, must be served on the claimant or his attorney. Upon the approval of said bond by the court or a judge thereof, an order discharging such lien may be made by the court or a judge thereof.

SEC. 25. This act is hereby declared to be a remedial statute and is to be construed liberally to secure the beneficial interests and purposes thereof; and a substantial compliance with its several provisions shall be sufficient for the validity of the lien, or liens hereinbefore provided for, and to give jurisdiction to the courts to enforce the same.

SEC. 26. Chapter one hundred and eighty-four of the laws of eighteen hundred and forty-six, chapter one hundred and sixty-nine of the laws of eighteen hundred and fifty-one, chapter three hundred and eighty-four of the laws of eighteen hundred and fifty-two, chapter four hundred and two of the laws of eighteen hundred and fifty-four, chapter six hundred and sixty-three of the laws of eighteen hundred and fifty-seven, chapter four hundred and seventy-eight of the laws of eighteen hundred and sixty-two, chapter five hundred of the laws of eighteen hundred and sixty-three, chapter three hundred and sixty-six of the laws of eighteen hundred and sixty-four, chapter seven hundred and seventy-eight of the laws of eighteen hundred and sixty-five, chapter five hundred and fifty-eight of the laws of eighteen hundred and sixty-nine, chapter one hundred and ninety-four of the laws of eighteen hundred and seventy, chapter four hundred and eighty-nine of the laws of eighteen hundred and seventy-three, chapter five hundred and fifty-one of the laws of eighteen hundred and seventy-four, chapter three hundred and seventy-nine of the laws of eighteen hundred and seventy-five, chapters one hundred and forty-three and four hundred and eighty-six of the laws of eighteen hundred and eighty, sections eighteen hundred and seven to eighteen hundred and twenty-three inclusive of chapter four hundred and ten of the laws of eighteen hundred and eighty-two, sections eleven to twenty-seven inclusive of chapter two hundred and seventy-six of the laws of eighteen hundred and eighty-three, and all acts amendatory of the above-mentioned acts or extending the provisions thereof, are hereby repealed. But this act shall not be so construed as to affect, enlarge, invalidate or defeat any lien or right to a lien now existing, or any proceeding to enforce such lien, now pending by virtue of any of the provisions of the acts hereby repealed, nor to revive any other or former acts or parts of act repealed by the acts hereby repealed.

SEC. 27. This act shall take effect immediately.

THE PALAZZO VECCHIO, FLORENCE.



Between Dormers, Nat. Hist Museum London. Eng. A. Waterhouse A.R.A. Archt.

ONE of the most imposing monuments in all Italy is the huge, fortress-like castle which has served for so many years as the seat of the popular government in Florence, and which from the throng of old associations centering about it, no less than from the gray, time-stained appearance of its walls, has received the name of the Palazzo Vecchio, or the ancient palace. Officially it is known as the Palazzo della Signoria. We are told that the gonfalonier and priors of the early republic were for a long time without any fixed residence, until about the year 1278, when it was decided to erect a strong castle in the centre of the city, of sufficient height and strength to protect the chief magistrates in case of insurrection, and to command the high towers which had been erected by the turbulent nobles all over the city. Arnolfo di Cambio, who had already distinguished himself by building the outer line of city walls, and who a few years later built the cathedral and restored the baptistery, was employed as the architect, and the Palazzo Vecchio as it now stands is substantially in appearance just as he designed it.

The building is totally lacking in those ideas of symmetry which were considered of so much importance by the later architects. The houses of the then powerful Vacca family occupied the space devoted to the palace, and were incorporated in part into the new structure, the Vacca tower being used by Arnolfo as a foundation for his more extensive erection, whence the later tower is considerably out of centre of the façade. The principal entrance, also, is small, and at one side the windows are placed solely with reference to the interior, and the archings of the corbelled cornice are unequal; but there is nevertheless a wonderful dignity and repose about the structure, which quite atones for any lack of arrangement, and the tower looms up so grandly and simply that even the crudest building would be ennobled by it. Arnolfo did not build all of the tower; at least it would seem more probable that the upper portion was completed at a later date, for the main building is crowned by square-topped battlements, a form used exclusively by the party of the Guelphs, which was in power at the time the palace was begun; while the swallow-tail form of the battlements about the top of the tower is the sign of the Ghibelline faction, though the finish may have been given this form by the republican government, in order to conciliate the opposite party. Trifles even more insignificant than these were sometimes a pretext for bloody civil war in those old Florentine days.

The Palazzo is built entirely of coursed rubble stone-work left with natural rock faces. The courses are small, and there are no large stones used anywhere, but the effect of the front is rather improved thereby, simple and unbroken as it is with so very few details. There is some carving about the windows of the two upper stories, one of which is shown on the sheet of sketches. The inner framework of the windows is of white marble, and in the spandrils are carved alternately the cross and the lily, the two popular Florentine emblems. The only other cut-work is on the two string-courses and the corbels. Arnolfo di Cambio seemed always to have known when to stop, and none of his buildings have a superabundance of ornamentation. At the north angle of the building is a large marble lion, the *Marzocco* of Florence, after a bronze by Dontatello, and over the door is a small canopy bearing two smaller lions; but both these features are comparatively modern additions.

The tower rises abruptly to a height of three hundred and eight feet. It is the most prominent object in Florence, and commands a magnificent view off over the city and along the broadening valley of the Arno. In a small cell near the top, barely three by six feet, Girolamo Savonarola was confined for forty days prior to his execution in the piazza before the palace. The spot where he suffered is marked by an ugly rococo fountain and an ungainly statue of Hercules by Bandinelli, an unworthy successor of the David by Michael Angelo, which stood here until 1873. In another small tower cell Cosimo I was imprisoned by the angry Florentines, and barely escaped with his life by bribing the new gonfalonier.

On the top of the tower is a small marble tablet commemorating a rather peculiar event in Florentine history, when the Gonfalonier Nicolo Capponi, in 1528, fearing equally the power of the Pope, the Medicis and the French, persuaded the people to cast a popular vote for Jesus Christ as King of Florence. Capponi placed a similar tablet over the entrance of the palace, but the proposed scheme was not altogether successful, as Cosimo I abrogated both the inscription and the liberties of the people very soon after.

Arnolfo's plan contemplated a simple rectangular structure enclosing an open court. Subsequent additions have been made in the rear, until now the palace occupies more than twice its original area, without, however, in any way interfering with the first scheme. The photo-print shows the interior of the court, which is surrounded by an open arcade resting on massive octagonal columns. These were originally of brick, but were found too weak for their load, and were accordingly removed, in 1434, and the present larger ones substituted, an operation which won a great reputation for the architect, Michelozzo Michelozzi, at a time when the principles of shoring were but imperfectly understood. The columns are covered with stucco ornaments, the ground of which was once gilded. A few traces of color are found on the capitals, and in its original condition the court must have presented a very brilliant appearance. The colors now are toned down to a soft, grayish yellow. The basin of the fountain in the centre is of porphyry. The graceful little bronze figure surmounting it was made by Andrea Verocchio, for the Medici villa at Careggi, and removed hither by Duke Cosimo. The walls of the arcades are covered with half-obliterated frescoes of views of various Austrian towns, and the vault is elaborately decorated with arabesques, fairly well preserved. All of this decorative work dates from 1565, when Francis de' Medici was married to Joan of Austria, niece of Charles V, and the palace was brightened up throughout in honor of the event. In the spandrels over the arches are the armorial bearings of Florence, the lily; the people, the cross; the Parta Guelpha, the eagle; and the Medici, balls; and the combined red and white of Florence and Fiesole.

The interior of the palace is hardly less interesting than the exterior. In the upper story is the Sala dell' Orologio, a magnificent room with a ceiling in blue and gold, richly carved with Florentine lilies and cherubs' heads, and a frieze with lions and armorial bearings. The walls are diapered with golden lilies on a blue ground. At present this hall is filled with the banners presented by the Italian cities which took part in the celebration of the sixth centenary of the birth of Dante, in 1865. The effect is quite bewildering, with the varied colored silks, the curious armorial devices and the bright blue and gold decorations. This room is the first of a long series of highly decorated apartments, which are entered through a marble doorway, by Benedetto da Majano, one of the most delicate bits of Renaissance detail in Florence, and quite equal to the beautiful pulpit which the same artist executed for Santa Croce. Further on is a small chapel dedicated to St. Bernard, which in its way is a little gem. The frescoes on the walls and ceilings are considered among the best works of Ghirlandajo, and on a bright day the chapel is one blaze of deep red, brown and gold.

In the main story, immediately under the Sala dell' Orologio, is the

Sala dei Dugenta, a finely proportioned chamber with an elaborately carved and panelled ceiling, the walls hung all around with rich old tapestries. This was the council chamber of the republic, and here Savonarola received his sentence and was led out through one of the front windows on to the scaffold, at which he and two fellow monks from San Marco were burned. At the rear of the same story is an immense audience hall, known as the Sala dei Cinque Cento. It occupies the whole width and nearly the entire height of the palace. It was enlarged to its present dimensions to serve as a meeting place for the Council of Fifteen Hundred, instituted in accordance with the suggestion of Savonarola at the time when all Florence was eagerly adopting the reforms he preached so earnestly. Michael Angelo, Leonardo da Vinci, San Gallo, Baccio d'Agnolo and Il Cronaca were appointed to consult together for the design, and though Il Cronaca was the nominal director of the work, all of these artists, as well as Bandinelli and Vasari assisted in its completion and decoration. Michael Angelo and Leonardo da Vinci prepared in competition the celebrated battle cartoons for the decoration of the walls of this hall. Da Vinci was allotted the work, but it is said he spent so much time experimenting with his colors that his splendid opportunity was lost by the return of the Medici to power and the subsequent abandonment of the scheme. The present frescoes, which were added at a later date, are quite unworthy of the noble hall. The panels of the richly-carved ceiling were painted in oil by Vasari, one of his most praised works, but about which it is hard to feel very much interest. The hall was appropriated to the use of the Italian Parliament after its removal from Turin, up to 1869. A large statue of Savonarola stands at one end of the room. The place seems bare and empty now, and one cannot help wishing it might be used as an Italian Westminster Hall, to be lined with statues of the great men of Italy.

Aside from its historical associations, the Palazzo Vecchio has an interest to the architect as affording an example of one of the boldest pieces of construction which the Italians have ever attempted. Indeed, standing in front of the building and looking up at the widely-overhanging cornice and gallery, and even more widely overhanging tower, the boldness of such construction seems almost like rashness, were it not justified by the manner in which it has stood the test of six hundred years without a crack or a settlement of any kind. Yet there is hardly a city to-day where the building laws would not prohibit such an attempt, and indeed it is doubtful if many architects would dare even to undertake work like this. Surely it could not be accomplished without masons possessing a greater degree of intelligence and more conscience than is common to such as are usually to be had in our great cities, for the safety of this construction can be said to depend as much on the adhesion of the stonework as on any balancing of thrusts or mere inert stability. By reference to the sheet of sketches it will be seen that around the top of the palace is an open gallery resting on a row of long corbels, the faces of which project four feet two inches from the face of the wall below. Figure 1 shows a section through this gallery. The wall on which it rests is seven feet six inches thick, all of solid masonry set in a very hard lime mortar. The gallery extends entirely around the four sides of the building, with no cross walls uniting it to the interior masonry. It is arched overhead, the thrust being relieved and the outer wall of the gallery tied-in by single inch-and-a-quarter iron rods, one between each of the outer arched openings. A detailed sketch of the corbel course is shown on the larger sheet. It will be noticed that the stone courses do not all run through into the wall; indeed, at the corner, the weakest part, the stones are all of rather small dimensions and there are no evidences of iron clamps having been used. Still, assuming that the masonry has set into one solid mass, this construction will be seen to be perfectly stable, as the balance of the weight is quite within the face of the lower wall. The weight of the roof, which rests entirely within the line of direct support, further aids in counteracting any tendency to yield by falling out. But when the tower is reached the construction becomes more complicated and doubtful; for, as will be seen by the section, Figure 2, the face of the tower apparently has nothing to carry it but the comparatively slight corbel-course just referred to, while at the top of the tower is another gallery, corbelled out four feet two inches, and set clear all around from the inner walls, so that the face of the upper part of the tower is eight feet four inches out from the face of the main wall of the palace. But by examining closely it will be seen that the construction here is if anything rather more secure than that of the lower gallery.

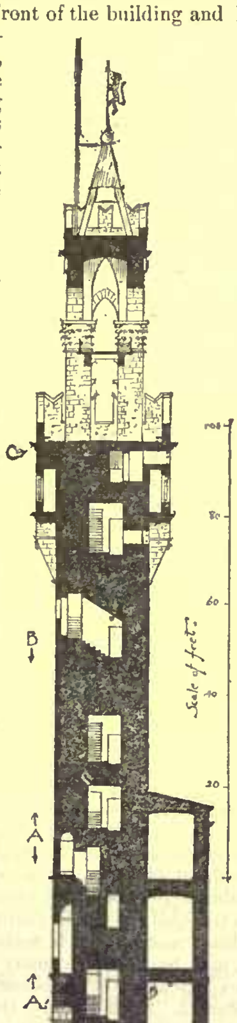


Fig. 2.

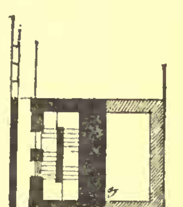


Fig. 4.

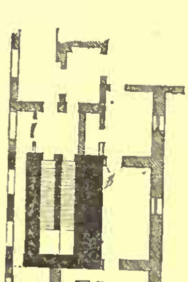


Fig. 3.



Fig. 1.

Figure 3 shows the plan of the tower on a level with the lower balcony, and Figure 4 the plan immediately above the main roof. In both of these figures the walls of the tower proper are shown solid, other masonry being cross-hatched. The rear wall is five feet six inches thick from top to bottom, extending unbroken to the ground. The side walls are about two feet six inches thick, while the front wall in the lower part is but eighteen inches through. The stairs go up through the first eighty feet of the tower entirely inside the lines of direct support, allowing a wall nearly three feet thick to be carried up plumb with the face of the building below. Consequently it will be seen that the balance of weight of the masonry, considering the walls as entirely homogeneous, is quite inside the direct supports, the enormous mass of the rear wall, which weighs approximately seven hundred tons, making the tower as stable as though it had solid bearing all around. And furthermore, though the lower corbels seem to carry the entire outer wall of the tower, in reality only a small portion of the weight thereof comes upon them, for the side walls form as it were two great corbels, the whole height of the tower, between and by which the front wall is supported at each end, so that the tower would undoubtedly remain secure if the corbels were entirely removed. A reasoning of this kind assumes that the walls were laid with more than usual care, and carefully bonded together, but no one who examines the tower in detail can doubt that this was throughout most thoroughly done. The only portion of the front wall supported directly on the corbels is then that between A and A in Figure 2, the lower part being the continuation of the main gallery about the building, and the upper a corresponding passage through the tower on the line of the main roof. At both levels the outer walls are tied back to the inner masonry by three one-and-a-half-inch iron bars, being, however, much more effectually tied in by the end walls, so that the corbels are by no means loaded up to their full capacity. It will be seen that though so much depended on the strength of the side walls, the architect did not hesitate to cut them at both these lower galleries, one wall being entirely cut away at the level shown in plan by Figure 3.

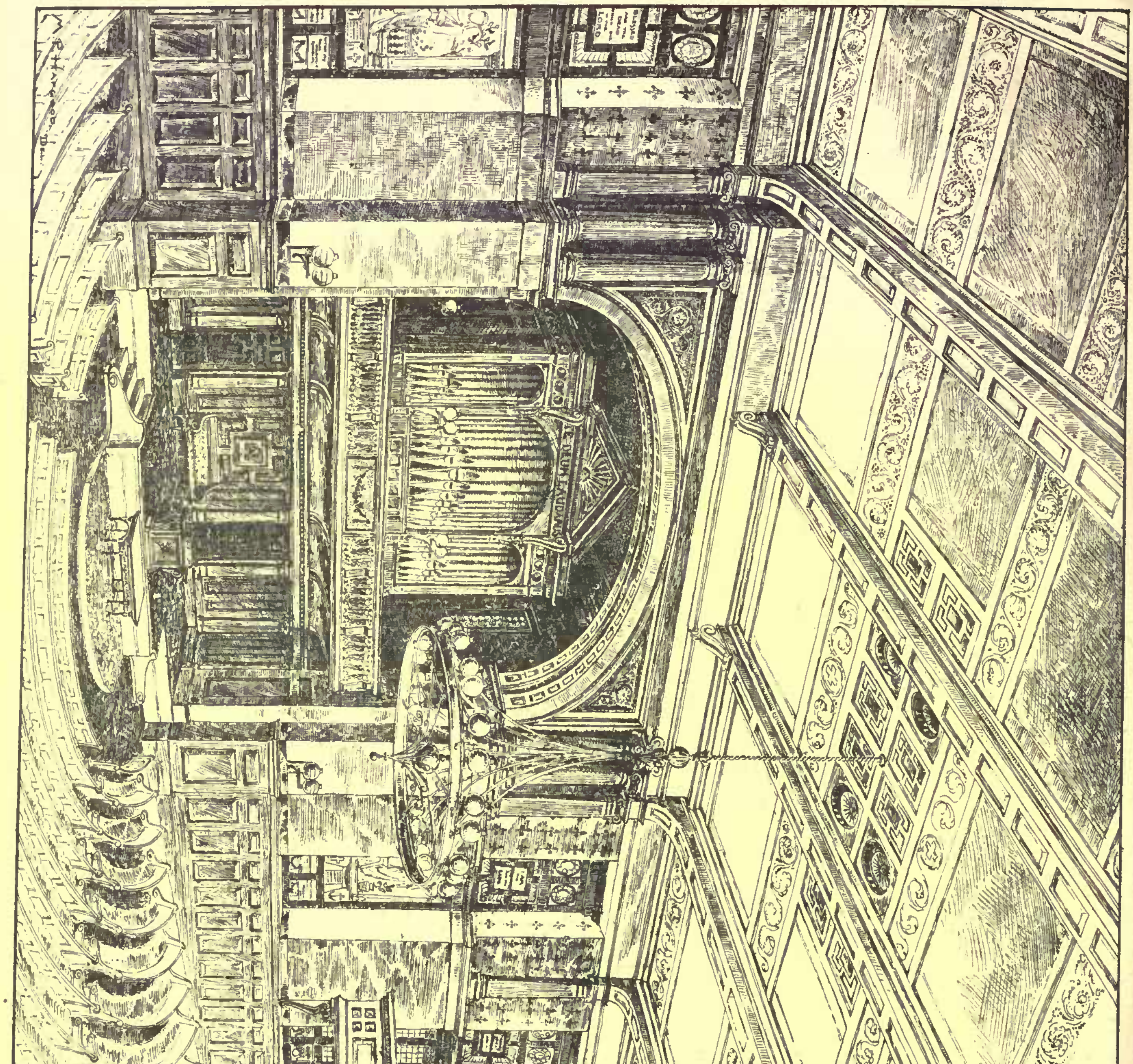
The outer portion of the tower between A and B, Figure 2, is shown solid, and, as nearly as could be ascertained, was built so. It is about seven feet six inches thick. There was no particular reason for making it thinner, as more than a third of it has a plumb bearing extending down to the ground, and the side walls are amply strong to sustain the remaining overhang. The chambers at the rear of the tower are for the works of the great clock. The walls extend down into the court and are borne by the arcades shown in the photo-print. The masonry being tied into the walls of the tower undoubtedly serve to a certain extent as an additional counterpoise.

As to the gallery around the top of the tower, the vertical weight is borne directly by the corbels, while any tendency to fall out is resisted by the masonry above, which forms the floor of the belvedere and effectually ties the whole top together. Immediately below the moulding at C, Figure 2, is an inch-and-three-quarters iron bar, passing entirely around the tower. This is undoubtedly a modern addition, as the masonry is abundantly secure without it; in fact, were there any real weakness at this point, so small a bar would count for very little.

The topmost part of the tower is borne on four stone columns, six feet in diameter. Between the arches above is hung a great bell, which is rung twice a day only. I have been on the tower repeatedly while the bell has been ringing, and have never detected the least jar or vibration in the masonry, so solidly is the whole built. A flight of stone steps winds around one of the columns, cutting up through the capital and the archings to the uppermost platform, where is suspended a second bell, which strikes the hours. The vault forming the floor of this platform is three feet six inches through at the crown.

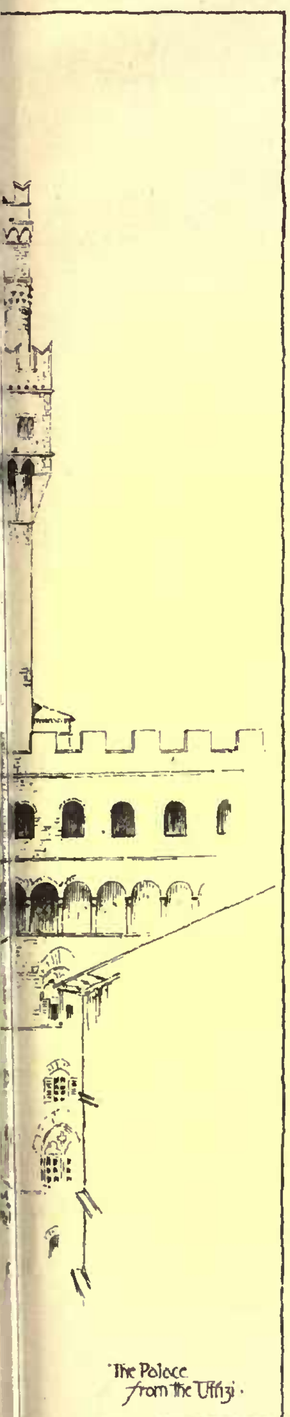
It is doubtful if nowadays a client would be found willing to pay for a tower with walls five feet six inches thick, one hundred feet up in the air, if indeed he could be persuaded of their utility; but even in the planning of less daring buildings, the study of such construction as this is capable of developing some very suggestive ideas.

C. H. BLACKALL.

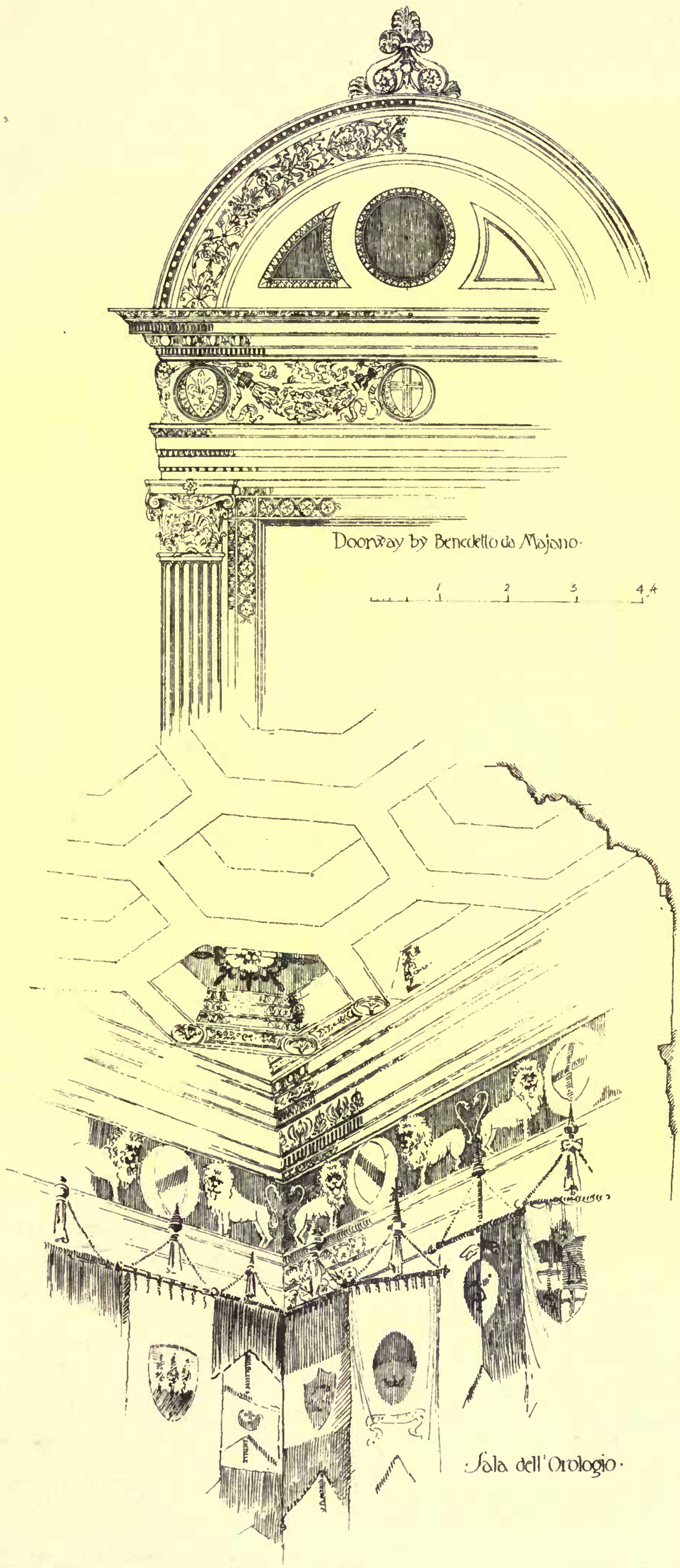

FIRST ECCLESIASTICAL SOCIETY
OF
WETHERSFIELD, CONN.
EDIFICE REMODELED BY
JOHN C. MEAD,
ARCHITECT.


Upper windows.
Lower Corbels
Capitals of Tower
Sketch
C:H:Bla

...OOD & CO



The Palace from the Uffizi.



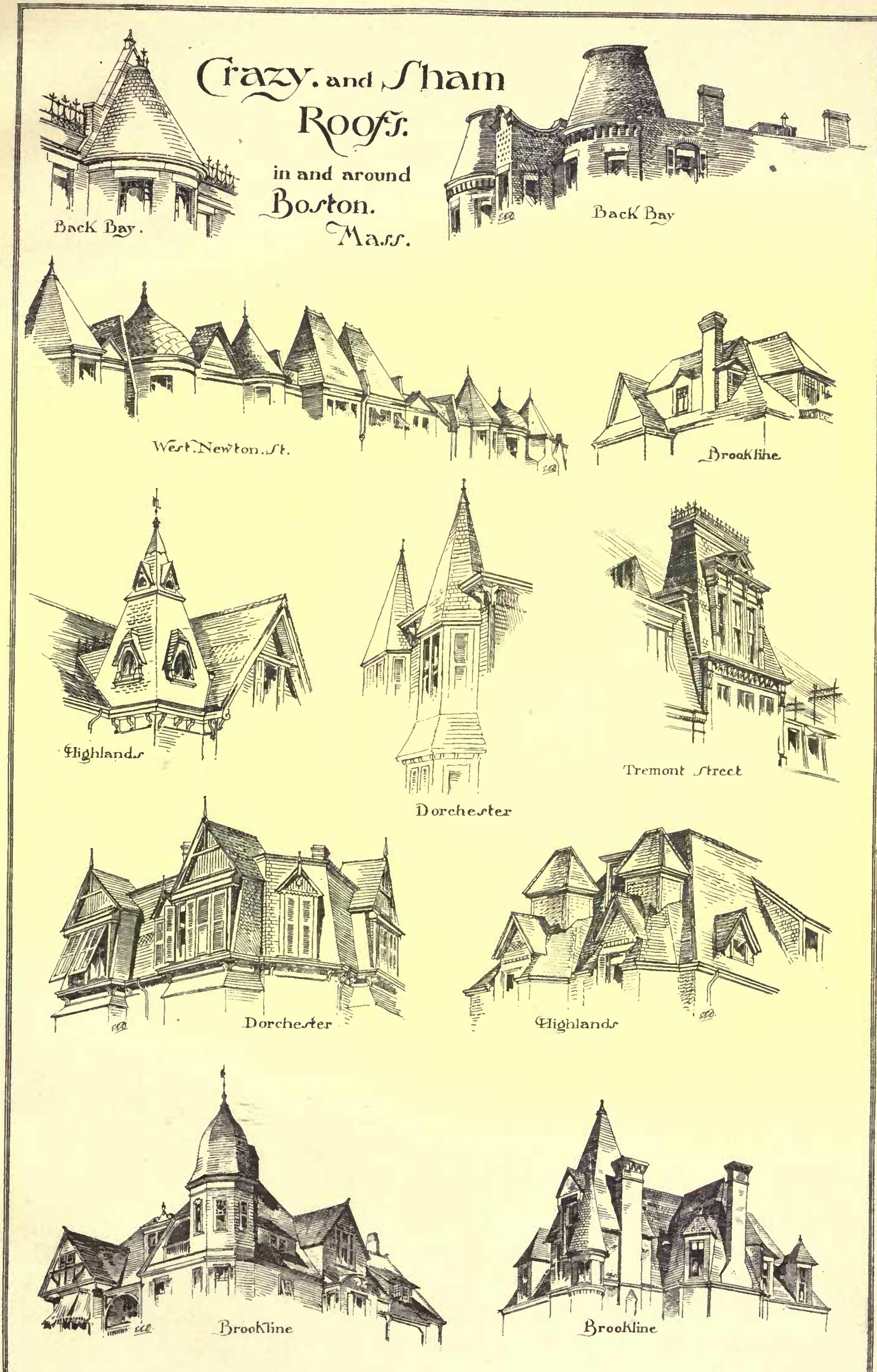
Doorway by Benedetto da Majano.

Sala dell'Orologio.

...ch from the · Palazzo Vecchio · Florence.

...II.

The Heliotype Printing Co. 211 Tremont St Boston.



HELIOTYPE PRINTING CO. BOSTON

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

SKETCHES FROM THE PALAZZO VECCHIO, FLORENCE, ITALY. BY MR. C. H. BLACKALL.

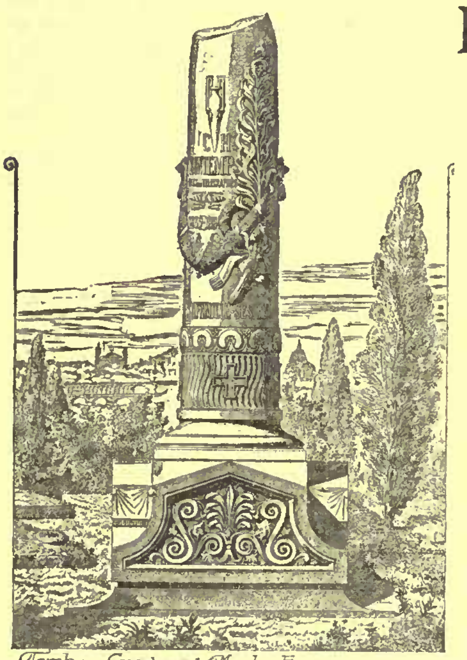
FOR description see article elsewhere in this issue.

CRAZY AND SHAM ROOFS IN AND ABOUT BOSTON, MASS.

INTERIOR OF THE FIRST ECCLESIASTICAL SOCIETY'S CHURCH, WETHERSFIELD, CONN. MR. JOHN C. MEAD, ARCHITECT, HARTFORD, CONN.

ON POINTS OF VIEW AND METHODS OF CRITICISM OF PUBLIC WORKS OF LANDSCAPE ARCHITECTURE. — I.

BROOKLINE, May 19, 1885.



Tomb in Cemetery at Meudon France
H. Boussard, Architect.

IN your issue of 18th of April (page 190) a gentleman tells of something that he has seen on one of the fields of work of the Boston Park Department, which, from his point of view, is a great wrong to the public, and an extreme illustration of professional morbid-mindedness. He asks how any other view of it is possible, implying that he is convinced that no other is possible. He adds that many persons are of his way of thinking. I think that I understand his point of view; that it is one from which I am every day taking much enjoyment of many things, and, looking at the occurrence exclusively from it, I respect and sympathize with the haste under which he has written. But I imagine myself, also, to have a moderately-clear idea of another point of view which may be taken with no less honesty and healthy simple-mindedness, and I am disposed to give some idea of it. I might have done so sooner, but since the letter appeared there has been an interregnum in the Department, and I have thought it more becoming to wait its termination.

How is it possible? It is possible that a different understanding may be had of the purpose of the work. We can agree, I presume, that it is a purpose to provide means of recreation, and that the occurrence witnessed was the destruction of means of recreation. But there are different kinds of recreation, and the destruction of means for one may be the preparation of means of another. What, then, was the special character of recreation to be had in view in this case? There is no clear, full, official statement of it in existence. We must find the answer in the general drift of the proceedings that have led the work to be undertaken. The purchase of the ground to be operated upon — the raw material — has been lately determined after a discussion of the proposition in the City Council and otherwise, publicly, that had continued sixteen years. The ground is five hundred acres in extent, and is situated at an extreme end of the city, seven miles distant from the dwellings of some of its people. Why should it have been thought better, after all this deliberation, to buy so much land in one place, and that so one-sided a place, rather than a dozen or more tracts equitably distributed, of the size, for example, of the Public Garden, all of which together would, perhaps, have cost less? There must have been some common-sense reason, or the obvious objection — an objection always having great weight, and which is generally recognized to have undue weight, in political bodies — would have made the result impossible.

The reason was, as is apparent from the course of debate, that something of a character that could not well be had on a site of the extent of the Public Garden, was, more or less clearly, felt to be wanted. Something different, also, from anything that could be seen in a long drive out of and around the city. Otherwise the argument against the scheme, that "we have a great park already, in all our beautiful suburbs," would have had more weight. Something different, also, from the best examples of landscape art in suburban villa grounds, and something yet again different from that which is enjoyed in passing through a rural neighborhood with scattered farmhouses, barns and other structures; with fields, diversified by a variety of crops and condition of tillage; with pastures, gardens, orchards and woodlands; but without striking natural features such as might be supplied by mountains.

What is this different thing? It must be something to which the topography of the site has been thought to specially lend itself, as well as something to the attainment of which a comparatively large extent of land was necessary. What, then, was to be found in the locality? First, and when the site was yet under debate, most conspicuously, there were upon it numerous homesteads, some of a villa character, some adapted to the wants of farmers and market-gardeners; with the proper following of barns, stables, ice-houses, glass-houses, poultry-yards, fences, lines of planted trees along the private boundaries, and so on. It was not because of these that the city wanted it. Imagine them out of the way; what then do we find? First, and most prominently, large woods and many small groves and separate shaws of "natural growth" (wildlings, indigenous, spontaneous, strictly natural). These have not hitherto been cleared away, because the land where they stand is much broken and made intractable by ledges and huddles of boulders, so that it could not be brought under tillage or economically built upon. Then, within and between the outworks of these eminent, forest-like spaces we find glades often sloping from them and running out with more or less undulation, into meadow spaces through and over which, when the city acquired the property, it needed little more than the removal of the artificial features to open pleasing landscapes, extending in some directions to faintly blueish, dreamy distance. In these meadowy spaces there are also a few trees, seedlings, indigenous, native, natural, but so scattered chiefly on the upper parts of the slopes as not to materially disturb the generally simple, broad, quiet character of the scenery below the rugged woodlands.

There were four comparatively elevated points where the artificial features could be so far overlooked that the elements of this quality of scenery could be best realized, and on three of these sheltered seats had been placed in order that visitors might form a better idea of the more important capabilities of the site.

Plainly it was because of these special capabilities that a site of the character and extent of that purchased was selected. To what sort of recreation, then, does the history of the undertaking thus far point, as the special purpose that should be had in view in the further prosecution of it?

It will be convenient to give a name to it, and then consider what the name signifies. Let us name it the recreation of pastoral park scenery. I use the word pastoral to avoid any association of ideas with what is seen on the common, smaller class of parks, so-called, of our cities.[1]

What, then, is the distinctive characteristic of pastoral park scenery?

I answer, first, that if what is to be seen in gardens, villa grounds or rural neighborhoods is properly to be called scenery, it is by distinction scenery of a smaller scale. That is to say, the field of pastoral scenery is less occupied by incident and the details that go to make it up are less obtrusive; are broader, simpler, more combinative and composable. It offers more undisturbed perspectives. Perspectives, consequently, of more imperceptible gradation, softer, more ethereal, ineffable; leading toward "the sublimity of mystery." Perspectives, consequently more persuasive to an unpurposed, drifting movement of the imagination. But, especially, pastoral park scenery, in contrast with what is to be enjoyed in gardens or in ordinary lowland villa or farmstead neighborhoods, illustrates what Hamerton in his new book calls "the curious truth that very much of the impressiveness [persuasiveness] of natural scenery depends on the degrees in which mass appears to predominate over details." ("*Landscape*," page 7.) There being in such scenery less of incident calling for close attention, such as we find in a sparkling fountain, a bright, new, bronze statue, a freshly-painted pavilion, a blue spruce, a red Japanese maple or a rose of any tint, highly developed in form by the skill of the floral gardener, it the more works upon the organization of those coming into it out of a variegated, bright and bustling city, disposed to a tranquil musing in meditative and imaginative mood; a nerve-soothing mood. Such scenery, the result of purely natural processes, may be found in many parts of our country. I have seen it and experienced the influence of it in Kentucky, Texas, Colorado and California. Such scenery, the result of art acting invitingly and suggestingly to nature (not masterfully), is often found in the old English parks; hence our term park-like.

The recreation to be obtained from such scenery is different from that to be obtained from many other types of scenery in which trees and turf and flowers are elements. Not as different as the pleasure we may take in perfumes from that we take in music, but so far different that means for obtaining it cannot be judged by the same standards of criticism without leading to misleading conclusions.

[1] "The beauty of park scenery," says Gilpin (1791) "is best displayed where hanging lawns screened with wood are connected with valleys, and where one part is continually playing in contrast with another." This is not the beauty that gives value to most of our city "parks."

I have sufficiently indicated a possible point of view from which the occurrence witnessed by your correspondent might, I think, be seen in a different aspect from that in which he presents it. Having done so, I fear that you will think that I have used quite all the space that can be allowed me. I would like very much, however, if you would let me, to take up the subject proposed in my heading, and, without reproach to your correspondent, to examine his statements, simply as a means of exhibiting the method and manner of work that, as a critic, he has casually fallen into. Then, in another letter, I should like to show how greatly this method and manner of leading and educating the public prevails, and to point to some of its established consequences.

Besides what has been considered, there were on the property the remains of a number of small orchards. Your correspondent says they were of "native growth," but he cannot mean that they were so in the sense that the word native is commonly used with reference to trees. They were transplanted, nursery-grown trees. They had been distorted by grafting, and mutilated by trimming and heading-down. In one sense they were "natural," but no more so in the sense that that term is rightly applied to matters of scenery or garden art, than pig-tails or cramped feet or bouquets of "forced" flowers. They had been set, also, in rigid, straight lines, equidistantly and rectangularly, upon surfaces of naturally meandering contours, up hill and down, and often in positions that would have been chosen for them had it been considered an object to obscure the finest views of the neighborhood. Some, for example, had been so placed as to mar the outlooks from the commanding points chosen for the shelters before named. The most interesting and picturesque landscape on the site was thus divided and obscured. Many of the trees are very old, decaying, in parts dead, and limbs were often falling from them. They were in scattered squads standing in broken order, and from the point of view from which an artist regards pastoral park scenery, though not, perhaps, from that from which he would enjoy a garden, the outlook from a suburban villa or a pleasing prospect of an agricultural neighborhood, they were generally of an aspect that he would consider dissipating to the genius of the place.

Since the land came into the possession of the city, a few laborers have been employed when they could be spared from work elsewhere in progress, in removing obstructions to drainage, making gaps in walls, tearing down buildings not worth as much as it would cost to remove them, cutting out dead and dying trees, burning rubbish and so on. With the rest they have uprooted some of the remains of the old orchards. From the point of view that I have aimed to set forth, what has been done in this last respect would seem to be in as simple and direct pursuance of the purpose which led the city with so much deliberation to purchase this particular field of scenery, as the removal of old cottages, farm-houses and flower-gardens, the object in each case being the opening to public enjoyment of elements of scenery more truly natural to the locality; scenery of a rather broad scale, pastoral and park-like.

But your correspondent looking at it exclusively from the point of view, so far as appears from his letter, of admiration of things lovely in themselves, not as elements of composition, certainly not of scenery, sees in the removal of these particular trees, which for twenty days in the year might have been hoped for some years to come to exhibit a crop of flowers, an action similar in character to the setting on fire of the most valuable treasures of a public museum of art. Taking this view, he characterizes it in terms that could not be stronger if those responsible for it were detestable barbarians — "a vandalism; a wanton outrage." He describes the feelings to which the contemplation of it gives rise, as finding expression in "objurgations loud and deep." Under their influence he makes haste to give the public particulars of the atrocity. In his haste he says, first, that all of the fruit trees have been destroyed; afterwards all, he is "sure, with the exception of a few;" lastly, that apple blossoms have been "abolished forever over the whole stricken region." I attribute these expressions to haste and excited feeling because they are not of critical accuracy. Yesterday I had the pleasure of passing through the property with the commissioners recently appointed to superintend the undertaking, and while in movement, without interruption of conversation, I counted four hundred fruit trees, most of them apple trees, just breaking into bloom. I saw other blooming trees in the distance on both sides; saw boys, also at a distance, carrying branches in blossom. I know of many fruit trees that the party did not pass near — probably there are two or three hundred more trees of conspicuous blossoms yet standing on the ground.

But the letter not only thus exhibits the haste and hasty inaccuracy of observation and of statement that is characteristic of the class I wish to consider, it manifests another trait common to it. I mean the conviction that no other view of the subject of criticism than that of the writer is possible, except to a mind morbidly insensible to natural beauty, and that has become so as the result of professional training. The writer, in this case, accounts for the unnatural propensity to destroy apple trees to which he bears witness; for instance, as "a fine professional disesteem for so common and vulgar a poor relation as these natural growths" — meaning by natural growths apple orchards. He does not recognize the possibility of any other explanation.

The expression of the common notion that a professional life particularly unfits a man for professional duties, is addressed, in this case, to a professional journal and is pointed by an unnecessary reference, as to a marked example of a professionally disordered state of mind, to a gentleman, the most valuable part of whose professional capital was acquired in a series of rovings on foot, or in saddle or boat, and otherwise under conditions favorable to an absorbing, contemplative observation of scenery, and mainly of unsophisticated natural scenery. He was occupied in this training process several years, during which he travelled in the manner stated upwards of six thousand miles. There is no reason to doubt that he was moved to such a course by an unusual sensitiveness to the charms of natural scenery, and though he has had above sixty public grounds to deal with in a "practical" way since — most of them much too small to be illustrations of scenery of any kind — and this practice may have been a little demoralizing, on the whole, in his own judgment, the effect has been to strengthen the original impulse.

With reference to the frequent presumption of public instructors that no man of healthy mind can take a different view from their own of the occurrences which move them to write, another circumstance of this special case should be noted.

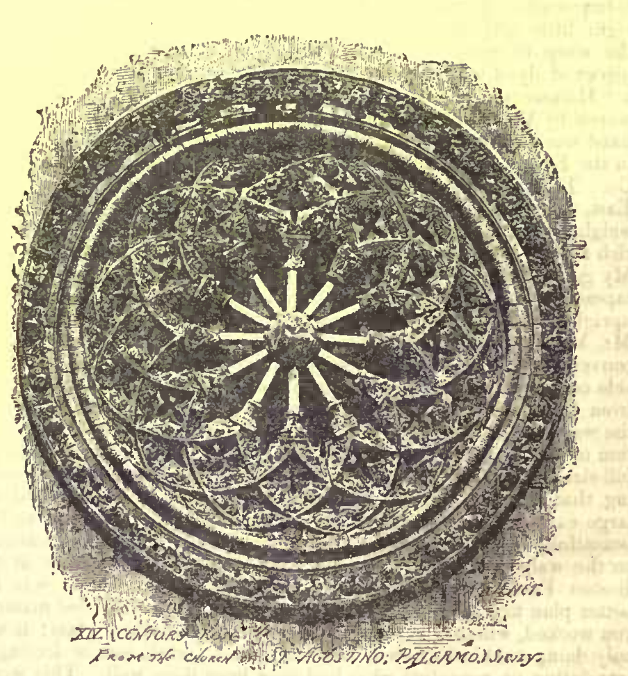
There were two well-known citizens of Boston who were exclusively answerable to the public for all work done upon this public property. The only person named by your correspondent had no formal official responsibility in the matter. Your correspondent's impression to the contrary was a surmise, based on the fact that this person had been professionally employed by those in charge of the park work in question, with reference to other of the duties committed to them. Incidentally, it happens, to this other employment, they had conferred with him occasionally about the park work, and the squad of men engaged in the preliminary clearing of the ground having been drawn from his professional field, he had sometimes passed orders to it (of which orders he fully approved). But whatever he may have done in the premises was gratuitously done, was of unofficial character, was entirely known to and fully sanctioned by his principals, and there is no reason to suppose that if he had never seen the place one tree the less would have disappeared.

It follows that if your correspondent's theory were a sound one, these citizens must be afflicted with the same calamity of professional morbid-mindedness, distaste for nature and fine disdain for the "vulgar" view of a park with the person he names. The fact is, that both have had leading parts in other important movements for opening the higher enjoyments of taste to the great body of the people. Both have shown, otherwise than in public works, special interest in sylvan beauty. Both have country places, in which they have for many years been practising unprofessional landscape work and with distinguished success. One of them has been notably engaged in such work more than forty years.

Clearly, the point of view of these gentlemen is not that of your correspondent, nor is it a perverted professional point of view.

F. L. O.

WILLIAM MORRIS AT WORK.



MANY years ago a number of kindred spirits, since then celebrated in the world of art, sought to redeem the decorative arts from the degraded position to which they had then fallen in England. Of this number, William Morris, Dante Gabriel Rosetti, Holman Hunt, and Barne Jones formed an important group. Their first efforts were put forth from a home in Queen's Square, Bloomsbury, London, where, until recently, the now well-known firm of Morris & Co. had a habitation.

In the world of letters, Mr. Morris, previous to this time, had

attained a high reputation as a poet by his "*Life and Death of Jason*" and "*The Earthly Paradise*," and perhaps by many people he will be remembered rather by his poems than by his later work in the decorative arts.

In everything made by Mr. Morris and his firm there is shown a conscientious endeavor to produce nothing that is not honest in construction and design, and of the highest artistic value. For instance, the furniture they make is simple in design, and but little enriched by carving. If you ask why, you will be frankly told that it is exceedingly difficult to get wood-carving executed in the right spirit. For one man among wood-carvers who can work as an artist, there are twenty that are mere wood-cutters, whose work is devoid of all feeling. No matter how good a design may be when represented on paper, when worked out in wood it looks dead.

Of very ornate furniture by Morris & Co., I saw two grand pianos, in which the effect of richness was obtained by painting. One was in a house on the Thames embankment, built from the designs of R. Norman Shaw, R. A. The case was of oak stained a dark olive-green, and the ornament which covered the whole case was painted on in metallic colors, slightly raised from the surface of the wood. The other piano was in progress in the hands of the artist, a Miss Faulkner, who has great skill in this work.

In the field of woven fabrics, in carpets, tapestries and wall-papers, in the execution of rich embroideries and stained-glass, we are much indebted to Mr. Morris for what he has done. Some distance from the smoke and dinginess of London, at Merton Abbey, a little village in Surrey, near Wimbledon, these branches of work are carried on, and here Mr. Morris spends the most of his time, designing and directing personally the whole of the work, from its first inception as a sketch, through all the minutiæ of detail, until the fabric, glass, or whatever it may be, is finished. This weaving and painting he speaks of in his admirable lectures as "the lesser arts of life." "I feel no shame," he says, "in standing before you as a professed pleader for these arts, as indeed I well may, since it is through them that I am the servant of the public, and earn my living with abundant pleasure." This work to him is in no sense the nature of a task, to be ground out so many hours a day, but a thing in which he has his heart and which is done joyfully.

The works are on the banks of a stream, the Wandle, and on the site of an old abbey, of which nothing now remains save the fragment of a ruined wall. Mr. John Ruskin and his disciples would be delighted with these "works." There are no chimneys belching forth clouds of smoke to poison the air, and no noisy whirl of steam-driven machinery; the water power of the stream suffices. Nor is the water foul with impurities from the dyeing processes; all the refuse liquid is filtered, and the stream leaves the works almost as pure as when it entered.

The different operatives work in different buildings, some built of wood, others of brick, and, although claiming no notice architecturally, yet being old and placed irregularly on the site, have as a whole a pleasing effect compared with the regulation brick factories so common in England. In one building carpets of several kinds were being made. In front of a large, upright warp, a group of six or eight little girls were closely seated, each with an allotted width of the warp to work upon, and deftly their fingers tied and cut the pieces of dyed wool which went to form the pile of this carpet, called a "Hammersmith," named so from these carpets having been first woven by Mr. Morris at his home in Hammersmith. This method of hand work on an upright warp is an ancient method, still practised in the East. "Hammersmith" carpets are specialties of Morris & Co. There are no such carpets made elsewhere, not even in the East, though the best India carpets may be compared with them in weight. In other rooms were hand-loom weavers, and on the looms rich fabrics in wool and silk, some with threads of gold interwoven. My guide led the way to another part of the building, where arras tapestries were being woven. Opening a door, we saw another upright warp, and were confronted by a stoutish gentleman. It was Mr. Morris. After a hearty shake of the hand, we soon got into conversation respecting the work in progress before us. On one side of the warp sat two young men, busy working in colored threads. from bobbins with long, sharp points. They worked on the back of the warp and could judge of the effect of their work from the reflection of it in a piece of mirror on the opposite side. Near by a large, full-size cartoon of the subject, on paper, lay on the floor. Observing that this was drawn in outline only, I asked Mr. Morris if the large cartoons were never colored. Drawing my attention to two beautifully colored drawings, at a reduced scale, framed and hanging on the walls, and which I at once recognized as having been at the Boston Foreign Exhibition in 1883, he explained that it was the better plan to work out a design in color direct, in whatever material you worked, whether in tapestry, weaving, or stained glass; it was only doing work over twice, with the almost certain loss of feeling in translating or repeating what had once been done well. This weaving of tapestry is no merely mechanical operation; it needs as much skill as in painting a picture. No one without an eye for color could attempt such a work. From time to time Mr. Morris would criticise, suggest or change some of the colors which the artists at the back of the warp wove in.

The subjects of these tapestries, each ten feet by seven feet, are named Flora and Pomona. The central figure in each was drawn by Mr. Burne Jones, who generally works in association with Mr. Morris where figure work either in fabrics or stained glass is required. There was an inscription on each, being lines from a poem by Mr. Morris.

ON THE FLORA (SPRING).

I am the handmaid of the earth;
I 'broider fair her glorious gown,
And deck her, on her days of mirth,
With many a garland of renown.

And white earth's little ones are fain
And play about the mother's hem,
I scatter every gift I gain
From sun and wind to gladden them.

ON THE POMONA (AUTUMN).

I am the ancient apple queen,
As once I was so am I now,
Forevermore a hope unseen
Between the blossom and the bough.

Ah, where's the river's vanished gold,
And where the windy graves of Troy?
Yet come I as I came of old,
From out the heart of summer's joy.

The two verses, of two lines each, are written in two lines, one at top and the other at bottom of each piece of tapestry.

In a large hall, or in a dining-room of generous dimensions, these tapestries would be admirable; as works of art they were most beautiful. It was suggested to me that a place might be found for them in America. The estimated price of each piece would be two thousand dollars, duty paid.

As we strolled from one workroom to another, I had time to notice mentally Mr. Morris's appearance. There is a kindly, benevolent expression on his face, which is perhaps helped by the patriarchal-looking grayish beard, and spectacles. Carrying a stick in his hand, which seemed a practical stave, and dressed very simply: a soft black felt hat on the head, blue cotton shirt, with collar, but no tie, he called to my mind what he had said on the subject of dress, in one of his lectures: —

"I speak of the art of dress with the more terror because civilization has settled for us males that art shall have no part in our clothes, and that we must in this matter occupy the unamiable position of critics of our betters. Rebel as I am, I bow to that decision, though I find it difficult to admit that a chimney-pot hat or a tail-coat is the embodiment of wisdom in clothes-philosophy; and sometimes, in my more sceptical moments, I puzzle myself in thinking why, when I am indoors, I should wear two coats, one with a back and no front, and the other with a front and no back; however, I have not near enough courage to suggest a rebellion against these stern sartorial laws, and after all, one can slip into and out of the queer things with great ease, and that being the case, it is far more important to me what other people wear than what I wear."

We went from the tapestry room to look at the process of dyeing wool, in a vat filled with indigo. This is a branch of the work Mr. Morris knows thoroughly; he is a practical dyer. As we watched the operator, Mr. Morris remarked; "Well, George, you've got a handsome pair of gloves on." The man's hands were stained a deep-blue. I asked if any of the dyes were injurious, and was informed that they were nearly all derived from the vegetable kingdom, and not injurious. "Of course, if not removed from the skin, a man might suffer from the pores being closed," said Mr. Morris, and then he told a story of the man whom a Pope had gilded all over, to take part in some procession, how that the gilding prevented breathing through the pores, and the man died.

I asked Mr. Morris if we should ever see him on the American side of the Atlantic. He laughed good naturedly, and remarked that he had many friends there who had asked him to visit them, and it is probable he may visit this country.

The day following my visit to the works at Merton Abbey, I went in company with one of Mr. Morris's partners to an interesting exhibition of old Persian work, a loan collection of pottery, fabrics and metal-work held at the Burlington Club, Saville Row. Some of the pieces shown were loaned by Sir Frederick Leighton, the President of the Royal Academy, Mr. H. A. Wallis, Mr. Wm. Morris and others. We had not been long in the room, which was well filled, when we met Mr. Morris again, in company with some ladies. Stick in hand, dressed just as if he had stepped in from the works, he contrasted strongly with a gentleman in the orthodox London attire, with whom, as we left, he was holding an argument in an elevated tone of voice, about the date or origin of one of the exhibits. That was my last glimpse of the author of "*The Earthly Paradise*."

First a poetical writer and then a worker in the arts which go to enrich our homes, Mr. Morris has latterly, to the regret of some, developed ideas of a socialistic kind. All who are familiar with the eloquent and earnest words he has uttered on the subject of art will know at once and understand his feelings on this subject. Like Mr. Ruskin, he has considered the relation of the worker to art, the degrading effects of merely mechanical toil, the void between the designer and the one who executes, and, being a man of intense feeling, he sees much in the present social relationships that is obstructive to the true progress of the arts.

Mr. Morris carries his theories as to art and labor into practice as far as may be, in the relations between himself and those in his service. To conclude, in the remark of a recent writer "All are in a certain sense his personal friends. He seeks that every man shall

take delight in the work of his own hands, and further that they shall each of them possess a certain daily period of leisure and relaxation. How all this will be regarded will mainly depend, of course, on our preconceived notions of what is right and what is wrong in matters political. Of one thing, however, there can be no doubt, and that is, that no personal motive or ignoble aim has prompted the new departure which has taken place in Mr. Morris's life."

FRESH OR STALE PORTLAND CEMENT.

Greenville, N. C., May 5, 1885.

To the Editors of the American Architect:—

Dear Sirs,—Will you oblige with your opinion on the following points, in order to settle a dispute?

Is cement (both Portland and Rosendale) deteriorated by age, even if kept in a perfectly dry condition? If so, why? Is there a chemical change? And, at any rate, is it not preferable at all times to use fresh cement?

Respectfully, E. B. R.

[We are afraid that our opinion will not do much to settle the dispute, as each party has some reason on his side. Both Portland and Rosendale cement absorb carbonic acid and moisture even from the dryest air, and gradually become "stale" or lose their property of forming new chemical combinations, when mixed with water. Portland cement, however, especially when underburnt, very frequently contains an excess of free caustic lime, which, when the cement is used immediately after its manufacture, causes it to swell very considerably, and sometimes destroys the masonry in which it is used. To avoid this very common danger, the English architects and engineers usually open at once the bags of Portland cement sent from the manufactory to the work, and empty the contents on the floor of a room, leaving them there, exposed to the air, and perhaps turning them occasionally, for about a month before use. The dry cement, if fresh, swells under this treatment, from the hydration of the particles of caustic lime. When it has become so far air-slaked that a little of it, made into a stiff paste with water, and put into a bottle, will not expand enough to burst the bottle, it is considered to be in proper condition for making mortar. If the air-slaking is carried beyond this point, the cement powder gradually loses its power of setting, and at last becomes as inert as so much fine sand.—Eds. American Architect.]

BOOKS ON HOTEL-BUILDING.

New York, June 10, 1885.

To the Editors of the American Architect:—

Dear Sirs,—Noticing in your issue of June 6 an inquiry about works on hotel construction, which you refer to your readers, I beg to say that the inquirer will find valuable information in the following books: E. Guyer, "*Das Hotelwesen der Gegenwart,*" 1874: 57 illustrations; "*Deutsches Bauhandbuch;*" Abplist. "*Baukunde des Architektur, Part II,*" contains a chapter on hotels, illustrated with numerous plans, the text being from the pen of Baurath Böckmann in Berlin; also a monograph on the large hotel "Kaiserhof" in Berlin, by the architects Von der Hude and Heinrike. There will also shortly be issued a volume in Part IV of the large work "*Handbuch der Architektur,*" treating of hotels, illustrated with cuts and plates.

I am not sufficiently familiar with the French literature to quote titles of books, but there are undoubtedly monographs on the subject, published in Paris.

Respectfully yours, Wm. Paul Gerhard.

ENGINEERING.

Brookline, Mass., May 29, 1885.

To the Editors of the American Architect:—

Dear Sirs,—In your edition of April 4 there is an article in the "Notes and Clippings" signed "*Engineering.*" Will you be kind enough to inform me as to what that refers; whether a paper published by that name, or simply the science. And if a paper, will you inform me as to where it is published? By so doing you will greatly oblige, Yours respectfully, Frank M. Morton.

["Engineering" is the leading weekly journal in the English language devoted to the interests of civil and mechanical engineers. It is published at 35-36 Bedford Street, Strand, London, W. C.—Eds. American Architect.]

A CORRECTION.

Newton, Mass., June 13, 1885.

To the Editors of the American Architect:—

Dear Sirs,—The font on page 282 of the *American Architect* of June 13 is from St. Martin's Church in Canterbury and not in the Cathedral. H. P. James.

NOTES AND CLIPPINGS.

Roman Tenement-Houses.—The Romans had to contend with the evils of enormous tenement-houses two thousand years ago. Gibbon mentions that Augustus and Nero repeatedly enacted that the height of dwellings within the walls of Rome should not exceed seventy feet from the ground. The space within the Roman walls was necessarily circumscribed. Much of this was occupied by the rich patricians and senators, with their palaces and gardens, so that the body of the Roman people were crowded into high tenements, and the different floors and apartments were divided among several families of plebeians, who suffered consequently in health and comfort. Juvenal, recognizing the unfortunate condition of the poor in this respect, advised them to leave the city and seek homes in the small towns.—*Exchange.*

Mortar.—Mortar for sewer works in all cases should be capable of setting in water. Portland cement and lias limes make good hydraulic mortar. The proportions of cement, or of lime to sand, should not exceed two and a half of clean, sharp sand to one by measure of ground Portland cement or lias lime. If clean furnace ashes or slag are available, there may be two of sand and one-half of ashes or slag, the whole to be mixed in a revolving pan, each pan-full to have twenty minutes' grinding. When mortar is used with bricks, the beds and joints should be spread thick and full over the entire area of both bed and joint, leaving, when pressed into place, a bed and joint never less than one-eighth of an inch in thickness of mortar. In four cubic yards of completed brickwork there should not be less than one cubic yard of mortar incorporated. In making mortar or concrete, it will be of the utmost importance to use clean materials and to preserve them clean; the water used for wetting bricks and for mixing concrete and mortar must be free from silt. Concrete and mortar should also be used on clean surfaces.—*Sir R. Rawlinson, C. E.*

Etymology of the Word "Dome."—It is doubtful how the word "dome" came to be applied to a cupola, or vaulted roof. A cathedral is in Italian *duomo,* in German *dom,* and a dome may be so called because it was the ornament of a cathedral church. A church in general was called *domus Dei,* the house of God, and probably the name was given to a cathedral church *par excellence.* On the other hand, we find that the Greek *doma* was used for a roof. The word *domus* is commonly derived from the Greek *demo,* to build, but this, I believe, is putting the cart before the horse. We have the most natural derivation for the word signifying a dwelling in the notion of a hearth or fireplace. The Finnish *sawu,* signifying smoke, is applied in the second place to a house, household, family living in a house, and in like manner the Welsh *mwg,* smoke, is identical with Breton *moug* or *mog,* a fire, hearth, household, house, while a derivative *moged* is in the latter dialect used for smoke. This mode of expression is almost universal in a rude state of society. "The census includes those provinces beyond the frontiers dependent on the empire which are numbered by fireplaces or houses."—"Population of China," Amer. Orient. Soc. Now the Polish *dym* (radically identical with *thumos* and *fumus*) is rendered smoke, cottage, house, while the form *dom* is also used in the latter sense. Bohemian *dym,* smoke; *dum,* a house; where the two senses are distinguished, as in Breton, by the modification *moug* and *moged,* Lithuanian *dumas,* smoke.—*Hensleigh Wedgewood, M. A.*

An Architect's Suit decided.—In the Second District Court, Judge Henry has filed a written opinion in the case of Charles D. Marvin against Dr. Clarence W. Butler and wife. The case was tried in March last. The facts were, that the defendants employed the plaintiff, a New York architect, to prepare plans and specifications for a dwelling-house, to be erected on Fullerton Avenue, Montclair. After the plans and specifications were drawn and the contractor's bids submitted, the defendants refused to accept the plans, and thereupon the architect demanded the usual commission for his services, on which, being refused, he brought suit. The defence interposed by the defendants was two-fold: First, that the plans called for a building which, if erected, would project beyond the defendants' lot a few inches; second, that the lowest bid of any contractor exceeded the stated amount the defendants wished to spend on the building. In reply, the plaintiff proved that the measurements of the lot were furnished by Dr. Butler, and therefore the error had been occasioned by the defendant's mistake, and that the changes in the original plans, made at the request of the defendants, had occasioned the increased cost. Judge Henry, after hearing A. E. Van Giesen for the defendants, and E. A. Rayner for the plaintiff, in a lengthy opinion reviewing both the law and the facts, holds that the plaintiff is entitled to recover a reasonable compensation for his services in preparing the plans, etc., and gave judgment in his favor.—*Building.*

A New Process for hardening Plaster.—A new process for rendering plaster very hard, and capable of being substituted for wood in flooring has been brought out by M. Julile. Plaster has this advantage over cements, and even over wood, that it increases rather than diminishes in bulk on being applied to structures; but it fails in hardness and surface resistance. To overcome this difficulty M. Julile mixes six parts of good plaster with one part of rich lime, recently slaked and finely sifted. This mixture is to be used like ordinary plaster, and the object made from it when it is very dry is caused to imbibe a solution of a sulphate which has a base precipitable by lime, and this precipitate insoluble. Such are the sulphates of zinc or iron. The theory of the process is as follows: The lime contained in the pores of the plaster decomposes the sulphate, with production of two insoluble bodies, to wit, sulphate of lime and oxide, which fill the pores of the object submitted to the treatment in question. With sulphate of zinc the object keeps of a white color, but with sulphate of iron the object at first greenish, takes on drying and with the lapse of time the color of the sesquinxide of iron. With sulphate of iron the hardest surfaces are obtained, the resistance to rupture being twenty times greater than with ordinary plaster. To obtain the maximum hardness and tenacity it is necessary that the object should first be very dry, and steeped in a solution which is practically saturated. The first immersion of the object in the solution ought not to last over two hours, as a too long immersion at first is apt to render the surface friable. On drying the plaster object afresh after the first immersion, there is no further fear of its becoming friable. If the proportion of slaked lime is too great, the surface is apt to take a very hard marble-like skin, which prevents the hardening of the inner portions of the object. The proportion of one of lime to six of plaster as stated above has given the best results. Plaques made in this way can be browned by rubbing them with linseed oil and litharge, and glazed on the surface with hard copal varnish. A beautiful glassy flooring like polished oak can in this way be prepared.—*Engineering.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

318,946. DEVICE FOR REMOVING WINDOW-SASH FROM FRAMES. — John Bowbin and Michael H. Croker, Chicago, Ill.
318,956. SHINGLE-SAWING MACHINE.—Frank Challoner, Omro, Wis.
318,957. ART OF RECUTTING FILES. — Luke Chapman, Collinsville, Conn.
318,962. STONE-CUTTING MACHINE. — John Crump and Richard Brereton, Philadelphia, Pa.
318,984. BEVEL FOR DRAUGHTSMAN OR ARTIFICERS.—Jasper J. Hedges, Athol, Mass.
318,988. WINDOW-SCREEN.—Frank and Anton Hubka, Chicago, Ill.
318,994. REAMER. — Everett L. Lake, Syracuse, N. Y.
318,998. SASH-FASTENER. — Jacob F. Maugans, Bellefontaine, O.
319,012. COMBINED SQUARE, MITER AND BEVEL. —John Muller, Kansas City, Mo.
319,027. METHOD OF MAKING TWISTED BORING-TOOLS. —Chas. Robin, Chester, Conn.
319,039. BENCH-PLANE. — Justus A. Traut, New Britain, Conn.
319,053. ELECTRIC BURGLAR-ALARM. — Joseph Barkhelmer, Des Moines, Iowa.
319,058. LOCK.—Edward W. Brettell, Newark, N. J.
319,062. HOT-AIR FURNACE. — Stephen T. Bryce, Dayton, O.
319,064. HEAT-REGULATOR. — Lyman C. Byce and Alzina Dias, Petaluma, Cal.
319,074. CHIMNEY-TOP. — Geo. Crompton, Worcester, Mass.
319,086. DOOR-CHECK.—Peter Forg, Boston, Mass.
319,087. BLIND-SLAT FASTENING. — Augustus M. Freeman, Ocean Grove, N. J.
319,099. ELEVATOR. — William A. Koneman, Chicago, Ill.
319,104. WINDOW.—Anton Matuska, Chicago, Ill.
319,113. DOOR-HANGER.—Silas H. Nye, Union City, Mich.
319,121. WEATHER-STRIP. — John W. Power, Carthage, Ind.
319,159. RATCHET-BRACE. — Edgar H. Whitney, Winchendon, Mass.
319,162. WEATHER-STRIP. — George Zitzman, Bennett, Pa.
319,168. WINDOW-SCREEN. — Jas. W. Bachus, New Windsor, Ill.
319,172. FIREPLACE HEATER. — Thos. J. Bartlett, Colorado, Tex.
319,205. SHUTTER-WORKER.—Alvin H. Dodd, Hudson, N. Y.
319,207. SHUTTER AND DOOR BOLT. — Andrew J. Doolittle, Hamden, Conn.
319,209. SHUTTER-FASTENER. — Tiberias Dougherty, Philadelphia, Pa.
319,215. SPRING-CALIPERS. — Charles P. Fay, Springfield, Mass.
319,228. METAL ROOFING. — Benedict Goodman, Auburn, Ind.
319,230-231. RADIATOR.—John Gormly, Provo City, Utah.
319,247. ROLLED WOOD-SCREW.—Hayward A. Harvey, Orange, N. J.
319,252. WINDOW-GUARD. — William Hinze, Newark, N. J.
319,265. WINDOW FRAME AND SASH. — John E. Jones, New York, N. Y.
319,275. SASH-HOLDER.—Cris Lee, Paducah, Ky.
319,288. FASTENING FOR MEETING-RAILS OF SASHES.—Thomas L. McKeen, Easton, Pa.
319,289. PIPE-JOINT.—Hugh McKenna and George D. Bulmer, Penn, Pa.
319,292. AUTOMATIC ELEVATOR-GATE. — John G. Meisner, Chicago, Ill.
319,324. SASH-FASTENER. — Thos. B. Ross, Evansville, Ind.
319,336. WATER-CLOSET.—Samuel F. Sniffen, New York, N. Y.
319,370. FIRE-ESCAPE. — Charles P. Willson, Summit Point, W. Va.
319,374. REFRIGERATOR BUILDING AND APPARATUS.—Thomas R. Wingrove, Baltimore, Md.
319,379. SASH-BALANCE. — Geo. W. Arnold, Knoxville, Ill.
319,390. PROCESS OF MAKING CONCRETE WALLS, BLOCKS, ETC.—Thos. W. Carrico, San Antonio, Tex.
319,414. SASH-FASTENER.— John Huth, Canton, O.
319,422. WINDOW-SCREEN. — Josiah K. Proctor, Philadelphia, Pa.
319,427. SASH-FASTENER.—Wm. J. Slyder, Troy, O.

SUMMARY OF THE WEEK.

Baltimore.

DWELLINGS.—John Gill, Jr., is to have built 6 three-st'y and basement brick and stone dwells., on North St., near Chase St., on lot 40' x 89' 5", to cost $12,000; from designs by J. A. & W. T. Wilson, architects.

BUILDING PERMITS. — Since our last report twenty-one permits have been granted, the more important of which are the following: —

E. Rosenfeld, three-st'y brick warehouse, 25' x 104', n w cor. Sharp and Perry Sts.

Jos. L. Amos, 2 three-st'y brick buildings, e s Madison St., s of North Ave.

Wm. M. Warfield, 6 two-st'y brick buildings, commencing n w cor. Gilmor and McHenry Sts.; and 7 two-st'y brick buildings, n s McHenry, w of Gilmor St.

Jacob Seeger Estate, 4 three-st'y brick buildings, e s Pennsylvania Ave., s of Union St., and 5 two-st'y buildings, n s Pear Alley, s of Union St.

Hugh Ward, three-st'y brick building, e s McKim St., between Eager and Chase Sts.

Brooklyn.

BUILDING PERMITS. — *Lorimer St., Nos.* 140 *and* 142, 2 three-st'y frame tenements, tin roofs; cost, each, $4,000; owner, Wm. Ernst, Stagg St., cor. Lorimer St.; architect, Th. Engelhardt.

Grove St., Nos. 22, 24, 26 *and* 28, between Broadway and Bushwick Ave., 5 three-st'y frame tenements, tin roofs; cost, $4,000; owner, David Lauer, 1534 Fulton St.; architect, A. Hill; builders, Weeks & Lauer.

Vernon Ave., n s, 345' e Marcy Ave., 3 two-st'y basement and attic brown-stone dwells., tin roofs; cost, each, $5,000; owner, Walter S. Davis, Stone Ave. and Truxton St.; architect, S. Peden, Jr.

Putnam Ave., s s, 340' w Nostrand Ave., 6 three-st'y brown-stone dwells., mansard, slate and tin roofs; cost, each, $5,500; owner, architect and builder, T. W. Swimm, 358 Putnam Ave.

Jefferson St., s s, 190' w Throop Ave., 2 two-st'y brown-stone dwells., tin roofs; cost, each, $5,000; owner and builder, Wm. Reynolds; architect, I. D. Reynolds.

Court St., w s, 59' n Third Pl., three-st'y brick store and dwell., tin roof; cost, $5,600; owner, Dr. Dugan, South Fourth St., cor. Fifth St.; builders, M. Smith and Gilmor & Trevor.

Manhattan Ave., w s, 75' s Greene St., four-st'y brick store and tenement, tin roof; cost, $10,000; owner, I. Walsh, 471 Manhattan Ave.; architect, H. Vollweiler; builder, J. D. Eggers.

Manhattan Ave., n e cor. Calyer St., 4 four-st'y brick stores and tenements, tin roofs; cost, total, $34,000; owner and builder, Henry Bogel, Calyer St., n w cor. Eckford St.; architect, H. Vollweiler.

Prospect Pl., n s, 150' w Vanderbilt Ave., 4 three-st'y brown-stone dwells., tin roofs; cost, each, $7,000; owner, Wm. C. Vosburgh, 116 Clermont Ave.; architects, Eastman & Daus; builders, Peter Kelly and W. Schepper.

Hancock St., Nos. 176, 178 *and* 180, 300' e Nostrand Ave., 3 three-st'y brown-stone dwells., tin roofs; cost, each, about $10,000; owner, Geo. G. Halleck, 393 Gates Ave., estate of G. Halleck, deceased, 401 Grand St., New York, and Alfred T. Lenard, 114 Madison Ave., New York; architect, J. B. Snook.

Bergen St., s s, 100' e Nostrand Ave., 5 two-st'y brown-stone dwells., tin roofs; cost, each, $5,500; owner, Martin Joost, 117 Hancock St.; architect, M. J. Morrill; contractor, P. Brady.

Metropolitan Ave., No. 55, n s, 25' w Olive St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,300; owner, Augustine Straub, 53 Metropolitan Ave.; architect, Th. Engelhardt; builders, P. Kunzweiler and C. Buchheit.

De Kalb Ave., s s, 50' e Evergreen Ave., 2 three-st'y frame (brick-filled) stores and tenements, tin roofs; cost, each, $3,500; owner, architect and builder, Henry Loeffler, 189 Stockton St.

Concord St., n s, 174' 8" e Gold St., one-st'y mission day school, etc., slate roof; cost, $7,500; owner, the Industrial School Association; architects, Parfitt Bros.; builders, Morris & Selover.

Park Ave., s e cor. Sandford St., one-st'y frame car-stable, gravel roof; cost, $13,000; owner, Nostrand Ave. R. R. Co.; architect, J. H. Hough; builders, S. F. Bartlett and J. B. Woodruff.

Nostrand Ave., s w cor. Park Ave., two-st'y frame car-house, gravel roof; cost, $10,000; owner, etc., same as last.

Fulton St., No. 1890, three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,000; owner, Benjamin Gramer, 95 Sumpter St.; architect, E. Schrampt; builders, J. Hertlin and C. Baur.

Newell St., w s, 95' n Norman Ave., three-st'y frame (brick-filled) tenement, gravel roof; cost, $4,500; owner, William Maywood, 212 Eckford St.; architect, Fr. Weber.

State St., n w cor. Boerum Pl., one-st'y brick car-house and stable, gravel roof; cost, $50,000; owner, Atlantic Ave. R. R. Co., Third Ave., cor. Atlantic Ave.; architects, W. H. Hazard, Son & Co.

ALTERATIONS. — *Tompkins Ave.*, n w cor. Quincy St., two-st'y brick extension, tin roof; cost, $3,000; owner, E. H. Eden, on premises; architect, I. D. Reynolds; builder, W. Zang.

Flatbush Ave., cor. Park Pl. and Carlton Ave., add three stories, mansard, slate and tin roof; also, four-st'y extension, tin roof; alteration for store and tenement; cost, $12,000; owner, H. W. Blattmacher, 378 Flatbush Ave.; architect, C. F. Eisenach; builders, J. M. Brown and P. S. Cootey.

Furman St., Nos. 147 *and* 149, raised three feet, new fronts, prepared for occupancy; cost, $12,000; owners, Lorin Palmer and G. L. Ford, 142 Columbia Heights and 97 Clark St.; architects, John Cox & Co.

South Ninth St., s s, 100' w Third St., five-st'y brick extension, tin roof, front taken down, and building extended five feet forward, front to be of brown-stone; cost, $12,000; owner, Joseph Applegate, Bedford Ave.; architect, E. F. Gaylor; builders, Thomas Gibbons and Jenkins & Gillies.

Clinton Ave., No. 66, one-st'y brick extension, tin roof, interior alterations; cost, $5,000; owner, Steven Cox; architect, A. Hill; builder, B. Linikin.

Atlantic Ave., Nos. 57, 59 *and* 61, repair damage by fire; cost, $4,000; owner, Henry Lindenberg, 62 Atlantic Ave.; builder, E. Smith.

Chicago.

BUILDING PERMITS. — Cobb & Pierpont, 2 three-st'y dwells., 409 Superior St.; cost, $14,000; architects, Cobb & Frost.

D. W. Ryan, two-st'y addition, 17 to 25 Coventry St.; cost, $2,500.

H. Schwalin, 2 three-st'y dwells., 3231 to 3233 South Park Ave.; cost, $10,000; architects, Furst & Rudolph.

R. Latholz, five-st'y warehouse, 184 to 186 Michigan Ave.; cost, $25,000; architect, E. Baumann.

Mrs. J. Fischer, two-st'y addition, 148 Hastings St.; cost, $2,500.

D. Russell, one-st'y addition, 51 North Desplaines St.; cost, $2,600.

F. Mange, three-st'y store and dwell., 544 Blue Island Ave.; cost, $12,000; architect, P. W. Ruehl.

M. Schmidt, 3 three-st'y stores and dwells., 2252 to 2256 State St.; cost, $30,000.

M. Hubs, two-st'y store and dwell., 208 North Ave.; cost, $4,000; architect, A. Boos.

W. Watson, two-st'y barn, 2640 Prairie Ave.; cost, $3,000; architects, Treat & Foltz.

J. F. Smith, 2 three-st'y stores and dwells., 12 to 16 South Halsted St.; cost, $15,000; architect, S. V. Shipman.

D. McCarthy, 3 three-st'y stores and dwells., 879 to 881 West Madison St.; cost, $11,000; architect, W. Strippelman.

J. C. Krasa, three-st'y dwell., 218 Maxwell St.; cost, $4,600; architect, A. Soula.

F. M. Mory, three-st'y dwell., 100 Bunker St.; cost, $4,200.

N. W. Leffer, three-st'y store and dwell., 858 West Lake St.; cost, $6,000; architect, E. Baumann.

J. C. Clement, one-st'y store and dwell., Western Ave and Monroe St.; cost, $6,000; architect, F. Baumann.

G. Weertz, 2 three-st'y stores and dwells., 900 to 902 Halsted St.; cost, $12,000; architect, H. Randolph.

H. Brause, three-st'y store and dwell., 575 Twelfth St.; cost, $5,000; architect, E. Sendilbach.

C. Wildner, three-st'y store and dwell., 418 Larrabee St.; cost, $8,000; architect, C. F. Berlin.

J. Schnoor, three-st'y dwell., 280 Fremont St.; cost, $6,000.

C. G. Bode, 4 three-st'y stores and dwells., 500 to 506 West Twelfth St.; cost, $40,000.

E. Peterson, two-st'y dwell., 814 Maplewood Ave.; cost, $4,700; architect, C. C. Fitch.

W. Staden, two-st'y flats, 210 West Huron St.; cost, $2,500.

B. B. Rockford, two-st'y dwell., 409 Centre St.; cost, $4,000.

Dr. A. H. Cooke, 2 two-st'y dwells., 334 Dearborn Ave.; cost, $8,000.

J. Carden, six-st'y malt house, 16 to 22 Cherry St.; cost, $30,000; architect, F. W. Wolf.

Mrs. C. Libke, three-st'y flats, 99 West Erie St.; cost, $6,500; architects, Burling & Whitehouse.

Mrs. M. Mahoney, three-st'y flats, 64 Whiting St.; cost, $8,000.

J. Telfer, two-st'y dwell., 327 Austin Ave.; cost, $3,500.

Church of the Redeemer, church, 251 to 255 Warren Ave.; cost, $40,000.

J. Heffy, three-st'y flats, 161 West Adams St.; cost, $6,000; architect, J. Hanlan.

H. O. Sullivan, four-st'y store and flats, 299 West Twelfth St.; cost, $5,000; architect, P. W. Ruehl.

T. Scholzen, four-st'y store and flats, 301 West Twelfth St.; cost, $5,000; architect, P. W. Ruehl.

M. M. Haltz, 3 two-st'y flats, 291 to 295 Robey St.; cost, $10,000.

Fortune Bros., four-st'y malt house; cost, $40,000.

C. Crede, addition, 169 to 171 Third Ave.; cost, $6,000.

O. Osmus, two-st'y dwell., 940 Twelfth St.; cost, $2,800.

G. Hormuth, two-st'y dwell., 942 Twelfth St.; cost, $3,300.

Mrs. M. B. Lincoln, three-st'y flats, 349 to 351 Van Buren St.; cost, $10,000; architect, J. S. Lincoln.

E. J. Lehman, two-st'y store, 198 to 200 State St.; cost, $15,000; architects, Treat & Foltz.

Mrs. D. Gillkson, two-st'y dwell., 304 Morgan St.; cost, $2,500.

H. & A. Keep, 2 six-st'y stores, 257 to 263 State St.; cost, $100,000; architect, T. V. Wadskier.

S. H. Frederich, two-st'y dwell., 1076 Leavitt St.; cost, $4,000.

F. Sweetser, four-st'y store and dwell., 175 to 177 Halsted St.; cost, $18,000; architect, J. M. Van Osdel.

Mrs. A. M. Holton, 3 two-st'y dwells., 304 to 308 Warren Ave.; cost, $14,000.

C. C. Nelson, three-st'y flats, 287 West Ohio St.; cost, $4,000.

J. M. Love, 3 two-st'y dwells.; cost, $10,500; architects, Wheelock & Clay.

J. M. Love, 5 two-st'y dwells., 3258 to 3266 Vernon Ave.; cost, $17,500; architects, Wheelock & Clay.

E. Ender, two-st'y dwell., 90 Lincoln Ave.; cost, $4,500.

N. R. Warwick, one-st'y addition, 150 to 154 Fifth Ave.; cost, $4,000.

F. Stantz, 2 two-st'y dwells., 408 to 410 Twenty-seventh St.; cost, $3,500.

J. Jenson, 4 one-st'y cottages, North Leavitt St.; cost, $4,500.

T. C. Duncan, two-st'y dwell., 590 Adams St.; cost, $7,000.

J. Hirsch, two-st'y dwell., 3430 Michigan Ave., cost, $20,000; architect, C. C. Miller.

H. B. Mason, three-st'y dwell., 29 Delaware St.; cost, $10,000; architects, Treat & Foltz.

H. L. Brown, two-st'y dwell., 301 Warren Ave.; cost, $5,000; architect, W. E. Carroll.

Cincinnati.

F. Doepke, one-and-one-half-st'y frame building, 391 East Third St.; cost, $3,900.

Hy. Ballman, two-st'y brick building, Baum and Observatory Ave.; cost, $3,300.

F. Schuler, two-st'y brick building, Lincoln Ave.; cost, $5,500.

C. Dineyer, three-st'y brick building, 366 McIntosh St.; cost, $3,000.

Wm. Northside, two-st'y brick building, Harrison and Fairmount Pike; cost, $4,100.

Wm. Menz, two-st'y brick building, Colman and Bank Sts.; cost, $3,300.

Henry Fisher, two-st'y brick building, Euclid and Boone Sts.; cost, $3,000.

F. Leutz, three-st'y brick building, Central Ave. and Bank St.; cost, $4,200.

R. Aukinson, two-st'y frame building, Wheeler and Warmer Sts.; cost, $2,000.
Total, $30,200.
Repairs, $3,900.
Total amount to date, $1,162,710.
Permits to date, 557.

Kansas City, Mo.

Building Permits. — Wm. Sitzler, brick business block, 1310 Walnut St.; cost, $4,000.
C. H. Price & Co., four-st'y stone and brick addition to business block, 40' x 75', King St.; cost, $13,000.
John Patton, five frame houses, on lots 25, 26, 27, 28 and 29 in Hyan and Scott's addition, cost, $5,000.
H. W. Ide, three-st'y brick business block, 301 and 303 West Ninth St.; cost, $10,000.
W. N. Walker, brick business block, East Eighteenth St.; cost, $3,500.
Gilie & Van Peyma, brick business block, Union Ave.; cost, $4,000.
John Schuarzel, four-and-one-half-st'y brick business block and hotel, southwest cor. of Missouri and Grand Aves.; cost, $45,000.
Joseph Street, four-st'y addition to hotel, 1045 and 1047 St. Louis Ave.; cost, $35,000.
Irving Queal, brick house, Tracy Ave.; cost, $3,500.
G. G. Rounds, brick house, West Fourteenth St.; cost, $12,000.

Minneapolis, Minn.

Building Permits. — C. A. Smith, frame dwell. and barn, West Twenty-fourth St. and South Emerson Ave.; cost, $5,500.
Eli Torrence, two-st'y wooden dwell. and barn, Park Ave. and Twenty-fifth St., s; cost, $10,800.
Alfred E. Merrill, two-st'y brick dwell., Harmon Pl., bet. Willow and Maple Sts.; cost, $10,000.
Dennis Firm, one-and-one-half-st'y wooden dwell., Third St., bet. Seventh and Eighth Aves., n; cost, $8,000.
Alex. Barnes, two-st'y wooden dwell., Lowell Ave., bet. Sixth and Eighth Aves., n; cost, $6,000.
Immanuel Baptist Church, two-st'y red brick church, Bloomington Ave. and Twenty-third St.; cost, $25,000.
T. B. Tafton, two-st'y brick veneered dwell. and store, Twenty-fifth St., cor. Bloomington St.; cost, $4,000.
Miss A. E. Hammond, two-st'y dwell., Stevens Ave., bet. Twenty-fourth and Twenty-fifth Sts.; cost, $4,500.
M. E. Lawson, two-st'y dwell., cor. Grand Ave. and Twenty-seventh St., s; cost, $3,000.
H. H. Barton, 3 two-st'y dwells., South Colfax Ave. and West Twenty-eighth St.; cost, $6,250.
Wm. Regan, two-st'y dwell., Ridgewood Ave., w of Lindley; cost, $6,300.
Mrs. M. A. Durtoch, brick store, 223 South Washington St.; cost, $8,000.
N. G. Merriam, brick store, northwest cor. Washington and Second Avs., n, cost, $8,000.
S. G. Daniels, brick tenement, Twentieth St., bet. Third and Fourth Aves., n; cost, $6,500.

New York.

Building Permits. — *Tenth Ave.*, e s, 80' 4" n Forty-ninth St., five-st'y brick tenement and store, tin roof; cost, $18,000; owner, Charles Hamberger, 71 East Third St.; architect, Wm. Graul.
Columbia St., No. 4, four-st'y brick tenement, tin roof; cost, $13,000; owner, Jas. L. Barclay, 14 East Forty-eighth St.; architect, James Cody; builder, Wm. W. Owens.
Cherry St., No. 136, five-st'y brick tenement and store, tin roof; cost, $18,000; owner, Henry Browning, 1453 Ave. A; architects, A. B. Ogden & Son.
Hester St., No. 3, six-st'y brick tenement, tin roof; cost, $15,000; owner, Estate of I. C. Delaplaine, New York Life Insurance and Trust Co., trustee; architect, M. C. Merritt.
Mercer St., Nos. 15 *and* 17, six-st'y brick (iron-front) store, tin roof; cost, $55,000; owner, Samuel Inslee, 410 Broadway; architect, Samuel A. Warner.
Tenth St., s s, 114' w Washington St., five-st'y brick stable, asphalt roof; cost, $45,000; owners, Beadleston & Woerz, 291 West Tenth St.; architects, A. Pfund & Son.
Baxter St., No. 34, *and Worth St., No.* 161, five-st'y brick tenement and stores, tin roofs; cost, $15,000; owners, Jacob Cohen and Louis Levy, cor. Baxter and Walker Sts.; architect, Frederick Ebeling.
Chambers St., Nos. 49 *and* 51, and *Reade St., Nos.* 25 *and* 27, seven-st'y brick, stone and iron bank office-building, brick and concrete roof; cost, $500,000; owner, Emigrant Industrial Savings Bank, 57 Chambers St.; architects, W. H. Hume and Little & O'Connor; mason, Isaac A. Hopper.
Greenwich St., s e cor. Watts St., six-st'y brick and stone store, tin roof; owner, Henry Welsh, 123 Waverly Pl.; architect, Geo. W. da Cunha.
Reade St., n w cor. Hudson St., six-st'y brick warehouse, tin roof; cost, $37,600; owner, Thomas Patten, 226 Greenwich St.; architect, Geo. Martin Huss; builders, C. Callahan and Grissler & Fausel.
Rivington St., No. 245, five-st'y brick tenement and store, tin roof; cost, $18,000; owner, Rudolph Bohm, 270 Grand St.; architect, Wm. Graul.
Rivington St., Nos. 247 *and* 249, five-st'y brick tenement and store, tin roof; cost, $12,000; owner and architect, same as last.
Whitehall St., s e cor. Bridge St., five-st'y brick tenement and store, tin roof; cost, $30,200; owner, Frederick Knief, n e cor. Beaver and New Sts.; architect, P. Henry Gilvarry; builders, E. Sorensen and Grissler & Fausel.
Rivington St., n e cor. Allen St., two-st'y brick dwell. and store, tin roof; cost, $3,000; owners, Geo. H. and Dietrich Werfelman, 303 Broome St.; architect, Wm. Graul.
First Ave., 381' s of, between Thirty-ninth and Fortieth Sts., two st'y brick pump and tank house, slate roof; cost, $5,600; owner, The Equitable Gas-Light Co., 340 Third Ave.; architect, A. W. Putnam Cramer; builder, Richard Deeves.
Worth St., No. 121, six-st'y brick and iron store, tin roof; cost, $20,600; owner, John P. Conlon, 301 West Fifty-fifth St.; architects, Berger & Baylies; builders, Gustav Staiger and C. W. Klappert's Sons.
Pine St., No. 1, eight-st'y iron and marble office-building, flat asphalt roof and slated mansard; cost, $30,000; owner, Continental Ins. Co., 100 Broadway; architect, H. Kreitler.
West Forty-first St., No. 310, five-st'y and base ment brick tenement, tin roof; cost, $16,000; owner, Peter Farley, 260 West Fifty-third St.; architects, Thom & Wilson.
West Forty-second St., Nos. 408, 410 *and* 412, 3 five-st'y brick tenements, tin roofs; cost, each, $17,000; owner and architect, Adolph Koschel, 228 West Forty-second St.
Fifty-ninth St., s e cor. Ninth Ave., 5 one-st'y brick stores, tin roofs; cost, each, $5,000; owner, John Boland, 337 Sixth Ave.; architect, J. M. Dunn; builder, C. J. Perry.
Tenth St., n s, about 48' e West Fourth St., four-st'y brick tenement, tin roof; cost, about $10,000; owners, H. A. & M. Hartman, 46 Clarkson St.; architect, P. H. Gilvarry; builders, George Derr and Chas. Lehmann.
Twenty-eighth St., s s, 175' w First Ave., five-st'y brick factory, tin roof; cost, $45,000; owner, Manhattan Brass Co., J. H. White, President, 14 West Thirty-ninth St.; architects, Schwarzmann & Buchman; builders, J. & L. Weber and C. W. Klappert's Sons.
Eighty-second St., n s, 175' e Fourth Ave., 2 five-st'y brick stone-front tenements, tin roofs; cost, each, $30,000; owners, Plundeke & Brandt, 303 East Eighty-sixth St., and 184 East Eighty-eighth St.; architects, Thom & Wilson.
East Eighty-fifth St., No. 107, five-st'y brick stone-front tenement, tin roof; cost, $18,000; owner, Simon Haberman, Belleville, N. J.; architect, John Brandt.
Ave. A, e s, extending from Seventy-first to Seventy-second St., ten-st'y brick malthouse, kiln and storehouse, gravel, tin and slate roof; cost, $70,000; owner, Charles Clausen, 43 East Seventy-fourth St.; architect, Adam Weber.
Third Ave., w s, 25' n Sixty-seventh St., 6 five-st'y brick tenements with stores, tin roofs; cost, $15,000 each; owners, Max S. Korn, 154 East Sixty-sixth St., Jacob Korn, 166 East Sixty-sixth St., and S. Herzog, 138 East Forty-seventh St.; architect, Alex. I. Finkle.
East Eighty-second St., No. 312, five-st'y brick tenement, tin roof; cost, $15,000; owner, Chas. Tillman, 507 East Eighty-fourth St.; architect, Charles Kinkel.
One Hundred and Twenty-second St., s s, 125' w Second Ave., four-st'y and basement brick carriage-factory, felt, asphalt and gravel roof; cost, $75,000; owner, James H. Butler, 179 East One Hundred and Eleventh St.; architect, Chas. Baxter.
Second Ave., n w cor. One Hundred and Fifth St., 5 five-st'y brick tenements; also one-st'y brick store, tin roofs; cost, tenements, $15,000 each; owner, Bella Hoffstadt, 427 East Fifty-eighth St.; architects, Cleverdon & Putzel.

St. Louis.

Building Permits. — Forty-five permits have been issued since our last report, twelve of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows:—
United States Marine Hospital, one-st'y brick boiler house, cost, $4,500; M. E. Bell, architect; J. F. Lonergan, contractor.
Mrs. Beckmann, two-st'y brick store and dwell.; cost, $2,800; H. Anderson, contractor.
H. E. Spiering, 2 adjacent two-st'y brick tenements; cost, $3,800; A. Beinke & Co., architects; P. Talk, contractor.
Mrs. Lungen, 3 adjacent two-st'y brick stores and tenements; cost, $9,000; Wm. Riewe & Son, contractors.
Wm. A. Slasterman, 2 adjacent two-st'y brick tenements; cost, $3,500; John Scott, contractor.
E. J. White, two-st'y brick office building; cost, $2,700; J. Taylor, architect; S. S. Jones, contractor.
Aug. Schuermann, 2 adjacent two-st'y brick dwells.; cost, $3,600; H. Schuermann, contractor.
Alexander Milne, 8 adjacent two-st'y brick dwells.; cost, $10,000; Meagher, architect; sub-let.
Jno. Kirtz, two-st'y brick store and rooms above; cost, $3,200; Fred Knittel, contractor.
James Meagher, two-and-one-half-st'y brick pork and smoke-house; cost, $20,000; Milburn & Rich, contractors.
Alfred Harrington, two-st'y brick dwell.; cost, $3,000; E. Mortimer, architect; M. B. Scanlon, contractor.
Simon Gardner, two-st'y brick dwell.; cost, $4,000; J. S. Parke, contractor.
B. Hoffmann, two-st'y brick dwell.; cost, $2,500; Thos. F. Marley, contractor.
Miss M. Thomas, two-st'y brick dwell.; cost, $2,500; Thos. F. Marley, contractor.
P. W. Tountleroy, two-st'y brick dwell.; cost, $5,000; Thos. F. Marley, contractor.

St. Paul, Minn.

Building Permits. — Two-st'y double dwell., s s of Nash St., bet. Mississippi and DeBow Sts.; cost, $5,355; owner, James Smith, Jr.
Two-st'y frame double dwell., w s of Broadway, bet. Tenth and Thirteenth Sts.; cost, $3,000; owner, John Nelson.
One-st'y frame dwell., s s of Hoffman Ave., bet. Short and Lizzie Sts.; cost, $2,500; owner, Mrs. Allyn.
Two-st'y brick block of stores and dwells., n s of East Seventh St., bet. Forest and Mandota Sts.; cost, $15,000; owner, M. Biefield.
Two-st'y frame dwell., n s of Cherry St., bet. Maria and Hoffman Sts.; cost, $2,000; owner, Robert Balentine.
Four-st'y brick stores and hotel, e s of Jackson St., bet. Sixth and Seventh Sts.; cost, $15,000; owner, H. H. Mayall.
Two-st'y brick veneer livery stable, s s of Selby Ave., bet. Western and Arundel Sts.; cost, $5,000; owner, Kimble P. Cullen.
One-st'y brick round-house and turn-table, e s of Custer St., bet. Odell Creek and Wood St.; owner, Minn. & N. W. R. R. Company.
One-st'y and two-st'y brick veneer freight house, e s of Ducas St., bet. Indiana and Chicago Aves.; cost, $7,000; owner, Minn. & N. W. R. R. Company.

Toledo.

Factory. — Brick manufacturing building, 100' x 120', four stories and basement, cor. Superior and Oak Sts., for Woolson Spice Co.; built by D. R. Locke; cost, about $35,000; N. B. Bacon, architect; A. Lombard, builder.
Houses. — Block of 4 brick dwellings, 80' front, two stories and basement, cor. Madison and Ontario Sts., for Mr. D. Tracy; cost, $15,000; O. W. Vallette, architect; Jno. V. Arnsman, builder.
Frame dwell. for Mr. Churchill on Superior St.; cost, about $6,000; O. W. Vallette, architect.
School Building. — Manual training school building on Madison St., brick, three stories and basement; cost, about $25,000; E. O. Fallis & Co., architects; A. Bentley, builder.
Store. — The contract for Lorenz Bros. five-st'y business building on Jefferson St. has been awarded to John V. Sanfleet; the cost will be about $20,000.
Three-st'y and basement building, 60' x 110', on St. Clair St., for Messrs. Coghlin & Lockwood; cost, about $16,000; N. B. Bacon, architect; Geo. Wilson, builder.
Superintendent of the Government Building. — Considerable interest is felt in the outcome of the contest for the superintendency of construction of the Government building here, to fill the vacancy caused by the resignation of Mr. D. W. Gibbs. The president, to avoid the charge of nepotism, refused his consent to the appointment of N. B. Bacon, who was strongly urged by citizens, irrespective of party. Two Democratic factions each have now a candidate nominated and urged at the department, and the result is awaited. Mr. Chas. Cook is the representative of one faction, and Mr. Thos. F. Huber of the other. Each was nominated without being previously notified, and each was much surprised. Each is worthy and accomplished, and the public will experience no great dissatisfaction whichever may receive the award of the appointment.
Alteration. Remodelling brick building into block of two dwells. on Locust St. for Mrs. Dr. Coldham; cost, about $4,500; N. B. Bacon, architect; Richard Hattersley, builder.

General Notes.

Ogdensburg, N. Y. — Frame school building; cost, $3,000; owner, School Committee; architects, Johnston & Buell.
Wilbraham, Mass. — At a special town meeting, the town voted to build a town-hall as a memorial to her soldiers, and it was voted to raise $1,000 for the purpose, and also to instruct the town treasurer to borrow a sum not exceeding $5,000 to carry out the plan. The town has decided to build the Memorial Hall at the centre village. The building committee chosen is Marcus F. Beebe, Henry Clark, Philip Potter, Francis Clark and James Morgan.

PROPOSALS.

GRANITE AND BRICK WORK, BASEMENT AND AREA WALLS.

[At Pittsburgh, Pa.]

Office of Supervising Architect,
Treasury Department,
Washington, D. C., June 11, 1885.

Sealed proposals will be received at this office until 2 p. m., **on the 16th day of July, 1885**, for furnishing all labor and material, stone, brick, mortar, etc., and building complete the basement and area walls of the extension of the court-house and post-office building at Pittsburgh, Pa., in accordance with drawings and specification, copies of which and any additional information may be obtained at this office or the office of the superintendent of the building.

Bids must be accompanied by a certified check for $500 drawn to the order of the "Secretary of the Treasury," as a guaranty that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered. M. E. BELL,
496 Supervising Architect.

POST-OFFICE LOCK-BOXES AND DRAWERS FOR U. S. POST-OFFICES.

Office of Supervising Architect,
Treasury Department,
Washington, D C., June 16th, 1885.

Sealed proposals will be received at this office **until 2 p. m. on the 7th day of July, 1885**, for supplying and delivering lock-boxes, lock-drawers, locks, pulls, plates, etc., for United States post-offices, in Government buildings, as may be ordered during the fiscal year ending June 30th, 1885.

Copies of the specification and any additional information may be had on application at this office.

Bids must be accompanied by a certified check for $500, drawn to the order of "The Secretary of the Treasury," as a guarantee that the bidder will enter into a contract if his bid or any portion thereof be accepted, and furnish such bond as may be required.

Bids received after the time of opening will not be considered. M. E. BELL,
496 Supervising Architect.

CUT GRANITE.

[At Washington, D. C.]

Office of Building for State,
War and Navy Departments,
Washington, D. C., June 10th, 1885.

Sealed proposals for furnishing, cutting and delivering all the Granite required for two winding stairways, in west wing of the Building for State, War and Navy Departments, in this city, will be received at this office **until 12 m., July 10th, 1885**, and opened immediately thereafter in presence of bidders.

Specifications, general instructions to bidders, and blank forms of proposal will be furnished to proprietors of established granite works on application to this office. THOS. LINCOLN CASEY,
496 Colonel, Corps of Engineers.



Heliotype Printing Co., Boston.

BOSTON OFFICES OF THE MUTUAL LIFE INSURANCE COMPANY OF NEW YORK.

PEABODY & STEARNS, Architects,

AND OF

THE NEW ENGLAND MUTUAL LIFE INSURANCE COMPANY.

BRADLEE & WINSLOW, Architects.

The American Architect and Building News.

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JUNE 27, 1885.

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CONTENTS.

THE enterprising Mr. Buddensiek has not had to wait long to learn the opinion of his jury as to the extent of his fault in building houses which fell down upon the people in them. After a trial lasting only about a week, his case was given to the jury, who promptly returned a verdict of "guilty according to the indictment." The indictment, as our readers will remember, was for manslaughter in the second degree, and the penalty provided by the statute is imprisonment for a term of not less than one nor more than fifteen years, with a fine at the discretion of the court. The judge, wisely considering that even a heavy fine would be a small punishment for a rich man, exacted only five hundred dollars, but added to this a sentence of ten years' imprisonment in the State Prison, at Sing Sing. Some of the later evidence in the case was of a rather singular character. It seems that Mr. Buddensiek was not a builder but a butcher by profession, and his counsel laid particular stress upon the fact that he was "no mechanic," and had, notwithstanding the experience which he might have gained in supervising the erection of two thousand houses, no knowledge of the art of construction. On this point, however, the judge very properly instructed the jury that the ignorance of any person in regard to the proper methods of doing work of which he assumed the direction did not relieve him of responsibility for the consequences of what was done; and he might have added, we think, that the very assumption of such direction by a man who did not understand the work which he undertook to control was an act of questionable propriety, which should be rebuked by holding him to the most rigid accountability.

THE oldest architect in the United States, Mr. William Tinsley of Cincinnati, died recently in that city, at the age of eighty-one. Coming to this country in 1851 from Clonmel, Ireland, where he had been diocesan architect, and had won merited distinction for his talents and character, he brought with him, like so many others of the pioneers in the profession here, a skill in the practice of his art which has unquestionably exerted a great influence in the development of architecture in Cincinnati. He was soon elected a member of the American Institute of Architects, and entrusted with many important commissions, among them being the Northwestern University buildings at Indianapolis, those of the State University at Bloomington, Indiana, and of Wabash University, the college buildings at Gambier, Ohio, and the Asylum for the Blind at Columbus; besides several churches and many private structures. Throughout his long and prosperous career he was distinguished almost as much for his integrity and amiability as for his professional attainments, and hundreds of warm friends mourn his decease.

ONE of the most difficult transfers of heavy structures yet attempted was successfully completed in Salem, Massachusetts, a few weeks ago, where a brick factory chimney, ninety feet high and only six and one-half feet in diameter at the base, was taken up and moved, with the aid of six men and two horses, one hundred feet, and safely deposited upon a new foundation. The chimney was nearly cylindrical, the upper diameter being five feet; and it was estimated that a sway of three inches from the vertical would bring it to the ground, so that great precautions were taken to prevent lateral movement in transferring it to the platform on which it was to be transported. A cage was first built around the chimney, consisting of horizontal timbers supporting shores, which extended twenty-three feet up the sides of the shaft, and were reinforced by a second set of shorter ones beneath. After these were in place, and well secured, holes were cut through the brickwork, and needles inserted, under which thirty-four jackscrews were placed, and the shoring and shaft raised together, high enough to allow a rough platform to be constructed under them, and rollers to be set in place. The platform, which was of strong plank, extended to the new position of the chimney, and by levelling it carefully, and employing a large number of rollers, the load, weighing one hundred and thirty tons, was easily moved into place.

A PHENOMENON has been observed in the Callowhill-Street bridge in Philadelphia which is of great interest to architects and engineers, although the tax-payers of Philadelphia probably take no satisfaction in it. A few days ago men were sent to repaint the girders of the bridge, and began, as a preliminary process, to scrape off the rust. The attention of the foreman was soon attracted by the unusual size and weight of the scales of rust which fell upon the railroad below, and, on picking some of them up, found that they were solid masses, from one-quarter to three-eighths of an inch in thickness. It is needless to say that plate-iron girders which had lost their substance by rust to such an extent as this would have little strength remaining, and the vibration of the bridge under the movement of a horse-car or loaded cart, which was so great as to compel the painters sitting on their swinging stage to cling to the ropes or the braces of the bridge to avoid being shaken off, indicated still further the necessity for an immediate inspection of the whole structure. The first examination was an informal one, made by persons living in the neighborhood, who found not only that some of the iron-work had been nearly eaten through by rust, but that the whole bridge, which is built on a steep rising grade, had moved down hill so far as to tear out the top courses of stone of the upper abutments, and to buckle the struts of the intermediate supports; while the movements of the roadway framework had cracked the asphalt over them, and forced out the paving-blocks between the horse-railway tracks. The bridge includes one span of three hundred and forty feet, and as there can be no trifling with girders of this length extensive repairs will probably be necessary. The structure was only completed in 1875, so that ten years of neglect have sufficed to bring it nearly to destruction, and those who have to design important iron roofs or bridges will do well to notice by this example how short is the life of such works if not properly cared for. In the case of the Callowhill-Street bridge, the corrosion was probably hastened by the action of the smoke from the locomotives which passed under it; but there are hundreds of bridges exposed to the same action, and the iron roofs of railway stations and manufactories are often subjected to similar or more dangerous influences.

THE editor of *Le Génie Civil* makes a suggestion for reducing the temperature of city streets in summer, which deserves to be remembered. Paris, perhaps on account of its asphalt pavements, and the light-colored stone of which its buildings are composed, is apt to be very hot in summer, and the glare from the streets and buildings adds to the discomfort of those who have to go about among them. The watering of the streets, which is carried on very industriously through the summer, modifies the heat materially, but the supply of water is not unlimited, and many people before M. de Nansouty have probably regretted the loss of the precious fluid which is poured over the asphalt from the watering-carts, and immediately runs off into the sewers, while others have, perhaps, like him, reflected upon the superior efficiency, in cleansing the air as well as the streets, of a gentle rain. With these ideas in his mind, M. de Nansouty proposes that instead of pouring water over the ground from a slight elevation, the city watering-carts should be so arranged as to force it through

something like the water-towers in use in this country for extinguishing conflagrations, to a height of eighty or ninety feet, delivering it through a fine rose, with perhaps a small turbine wheel under it, in order to diffuse the falling drops over the greatest possible area. Such a shower as this would wash and moisten the air of the streets like a mist, and the whole effect of the water would be available, without loss or waste. The principal objection to delivering the water at a height, instead of near the ground-level, would of course be the danger of injuring the clothes of persons passing along the streets, but this might be lessened by restricting the artificial rain-storms to certain hours in the night or early morning. An improvement on the system of movable water-towers might perhaps be made by running perforated pipes along the cornices of the houses fronting on streets so regularly built as those of Paris. A powerful steam pump could easily supply such pipes over a large area, and the same amount of water could, we should suppose, be delivered in this way much more economically than through movable apparatus.

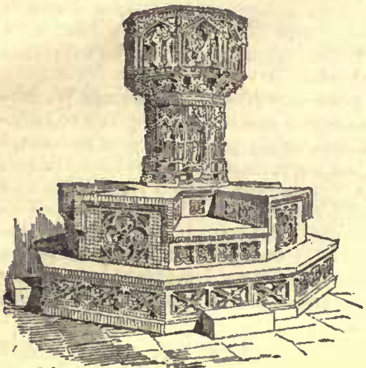
A MOTION was made a few days ago in the British House of Commons by the distinguished naturalist and geologist, Sir John Lubbock, for the appointment of a committee to ascertain whether the forests and woodlands of England could not be made more productive by the establishment of a public school of forestry, such as now exists in nearly every other civilized country. To say nothing of the three million acres or so of forest in the United Kingdom, there are, as is estimated, not less than three hundred and forty million acres of woodland in the colonies belonging to the empire; so that, as he said, the interest of Great Britain in the subject is really greater than that of any other nation. So far is this, however, from being generally recognized that there is no place in England where students can learn the principles of forest conservation and management; and the officers intended for the Indian Forest Service are sent to the French Forestry School at Nancy to be instructed; while the public woodlands in Cyprus and at the Cape of Good Hope are entrusted to the care of foreigners, for want of British subjects capable of looking after them. To show the advantages to the country which would follow the adoption of a better system, the mover of the resolution cited the example of the Landes, a vast plain on the west coast of France, which thirty years ago was a marshy waste, over which a few shepherds, perched on long stilts, to keep themselves out of the mud, drove their poor flocks; but which is now, thanks to Brémontier, who took the first step toward its reclamation by planting a few maritime pines along the sand-hills which line the shore, one of the most prosperous districts in the Republic, busy with the manufacture of turpentine and timber from more than a hundred thousand acres of recently planted forest, and officially rated as having increased in valuation about two hundred millions of dollars within less than a generation. To this illustration he added one more from the recent history of India, where, fifteen years ago, the annual public revenue from forest property was one hundred and ten thousand dollars. Soon after that time an Indian Forest Department was established, which provides expert direction for the maintenance and increase of woodland, and the forest revenue has since rapidly increased, amounting now to more than two million dollars a year, or about twenty times as much as it was just before the establishment of the Forest Department. In seconding the motion of Sir John Lubbock, Dr. Lyons remarked that the best authorities now believed that in order to keep a cultivated country in the most productive condition, from one-fourth to one-third of its area should be covered with woodland, as a protection; and Mr. Gladstone, whose fancy for wielding an axe is well known, showed his knowledge of the subject by remarking, in answer to a rather personal allusion from one of the speakers, that the judicious felling of trees is necessary to the proper maintenance of a forest; and that nothing tended more to perpetuate the neglected and useless condition which educated foresters observed in English woodland than the superstition of the owners, who looked upon the cutting down of a tree as a sort of sacrilege, instead of the means of developing the saplings about it.

AN unexpected light has been thrown upon the vexed question of Greek polychromatic decoration, as applied to buildings, by the recent discovery in Athens, among the fragments buried about the base of the Propylæa, of a considerable number of pieces belonging to a cornice, and composed of a soft, porous stone. It is well known that the marble gateway to the sacred hill of the Acropolis, which was built about the middle of the fifth century, B. C., and still remains in a ruined condition, was erected upon the site of an earlier structure, and it seems in every way likely that the blocks from the original Propylæa, which was probably of common stone, were used in the foundations of the more costly building which superseded it, so that these fragments of wrought stone may, with tolerable certainty, be presumed to have belonged, if not to the archaic Propylæa, at least to some other Athenian building of a date more remote than the fifth century before the Christian era; and it is therefore particularly interesting to learn that when taken from the excavations they were found to have been brilliantly colored in red, blue and gold, the pigments used being apparently of the same character as those which are still found in the sheltered interstices of the mouldings in the marble buildings of the Periclean age.

THE first discovery of these remains of painted decoration upon the Grecian Doric buildings, which was made twenty years ago in Athens by Mr. Penrose, and in Sicily by MM. Hittorff and Zanth, caused great commotion among the critics and dilettanti of those days, who had talked so long about the "chaste serenity" and "divine purity" of the marble buildings of Greece, and had tried so hard to lash themselves into what they thought was an appreciation of these qualities, that they resented as a grievous imputation on their superior artistic feeling the inference drawn by these architects from their discoveries, that the Greeks, far from delighting in pure white surfaces, were accustomed to paint their marble buildings with colors and patterns of almost barbaric vividness. For a time they remained incredulous, but proofs of the fact accumulated, until the defenders of classic serenity were compelled to abandon their original ground, and to take refuge in the theory that the Greek architects of the Periclean age had designed their buildings in white, but that in later times, particularly after the invasion of the Romans, who are generally regarded by æsthetic critics as the corruptors of antique taste, the perceptions of the Athenians became so debased that they laid violent hands on the chaste architecture of their forefathers, and painted it with staring colors to please their depraved fancy. There was always the difficulty about this theory, that it did not explain the painting of the temples in the Sicilian cities, which were laid utterly waste by the Carthaginians before Pericles was born; but it afforded at least a ray of comfort, and has been cherished accordingly. Now, however, even this must be abandoned, and, in the light of the latest discoveries, there can hardly be any further doubt that the Athenian buildings were, from the earlist times, painted in what we should consider very crude colors and unrefined patterns; and that the architects of the classic period continued the practice of their predecessors without a thought of the pain which their conduct would bring to the sensitive souls of Hyperborean critics twenty-three hundred years later.

IN accordance with a prediction made long ago by Professor Riley, the Government entomologist, the seventeen-year locust has made its appearance on Long Island, and in many other portions of the Middle States. Professor Riley has, since the last appearance of the insect, watched the development of its young in the ground, where it lives for seventeen years as a larva, undergoing various changes, until it reaches maturity and appears on the surface. In some parts of the country the locusts have already done much damage to the crops, but, as a partial compensation, they have afforded great amusement to the Brooklyn children, who have discovered a brood of them near the lake in the Park, and have combined instruction with pleasure by watching the crawling chrysalids emerge from the ground and then killing them. Whether the broods increase in size from year to year seems to be doubtful. Many agencies, among which the English sparrow is one of the most energetic, combine to destroy the insects; but the survivors are numerous enough to threaten very seriously the prospects of the farmers in the regions where they make their appearance. Professor Riley, in scientific enthusiasm, has set the example of eating them, both as larvæ and in the mature stage, and regards them, if we may believe the newspaper accounts, as a delicious food; but we imagine that it will be a long time before people of less sophisticated tastes will imitate him.

PECULIARITIES OF COUNTRY CHURCHES IN ENGLAND.—I.[1]

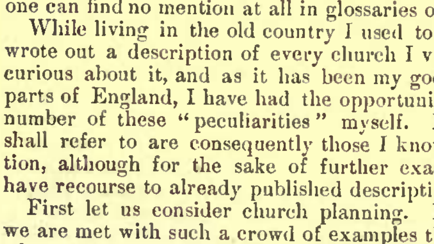

Font in Walsingham Church Norfolk, Eng.

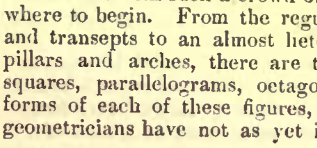
PERHAPS one of the most pleasant ways of spending a holiday in England, and one in which perfect mental rest can be obtained, is to take a rambling tour through two or three counties, following up some favorite pursuit, such as geology, archæology, botany, or architecture, or any one of a dozen such interesting fields of inquiry and instruction. In England, where every village has a history of a thousand years, many weeks may slip away before the tourist has gone half over a county, if he is "doing it" thoroughly, or has noted or sketched one-quarter of the interesting features, either in Nature or in art, that he meets in every mile of his way. In a holiday a man needs to get away from worries, vexations and disappointments of every-day business, but he should have some special interest to occupy his mind, or else his thoughts will be continually reverting to his office in the city, and he will be wondering how his clerks, pupils and contractors, and the works they are all engaged upon, are proceeding, and he will be wishing a thousand times that he had telephonic communication with all of them at once.

If architecture is his hobby, he can hardly do better than to go to some county like Lincolnshire or Northamptonshire, which literally teem with churches, almost every stone of which he may find it worth his while to examine. The cathedrals and large city churches throughout the country are tolerably well known to students and travellers, and for the sake of instruction these principal ecclesiastical edifices are undoubtedly the best for a young architect to visit, but having mastered the details of English architecture, by the study of the finest examples, he will find it very greatly to his advantage to hunt up out-of-the-way churches and make a thorough investigation of the details and peculiarities he finds there. It is not my intention in these pages to discuss the principles of style or detail, or to call attention to the examples of each century's work and character, as exemplified in all the well-known monuments of the art existing throughout the length and breadth of the land. I propose to keep clear of railways and the busy haunts of men, and make a cursory examination of wayside churches, pointing out some of the peculiarities in arrangement of plans, treatment of elevations, and the design of details to be found everywhere. A very great many of these are noted each year and published in the architectural journals, but the area for investigation is so large and the churches so innumerable that one is constantly coming upon most interesting specimens, of which one can find no mention at all in glossaries or other publications.

While living in the old country I used to keep a book in which I wrote out a description of every church I visited that had anything curious about it, and as it has been my good fortune to live in all parts of England, I have had the opportunity of seeing a very large number of these "peculiarities" myself. Most of the churches I shall refer to are consequently those I know from my own observation, although for the sake of further example I may occasionally have recourse to already published descriptions.

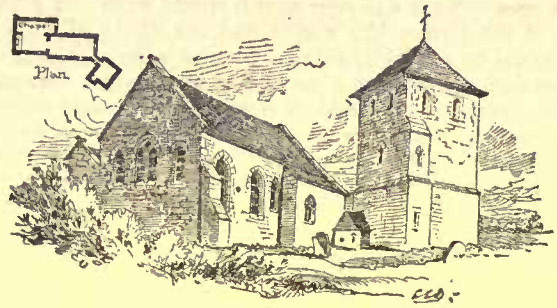
First let us consider church planning. Here, at the very outset, we are met with such a crowd of examples that it is difficult to know where to begin. From the regular cruciform plan of nave, chancel and transepts to an almost heterogeneous conglomeration of walls, pillars and arches, there are to be found all imaginable shapes: squares, parallelograms, octagons, circles, irregular and crooked forms of each of these figures, and still other patterns for which geometricians have not as yet invented names. For example, take the plan which is the first alteration from the cruciform, viz., that without transepts. Rothwell Church, Northamptonshire, is a good example. The plan consists of nave and aisles, with a tower at the west end and a chancel in the east, almost as long as the nave.





Rothwell Church, Northamptonshire.

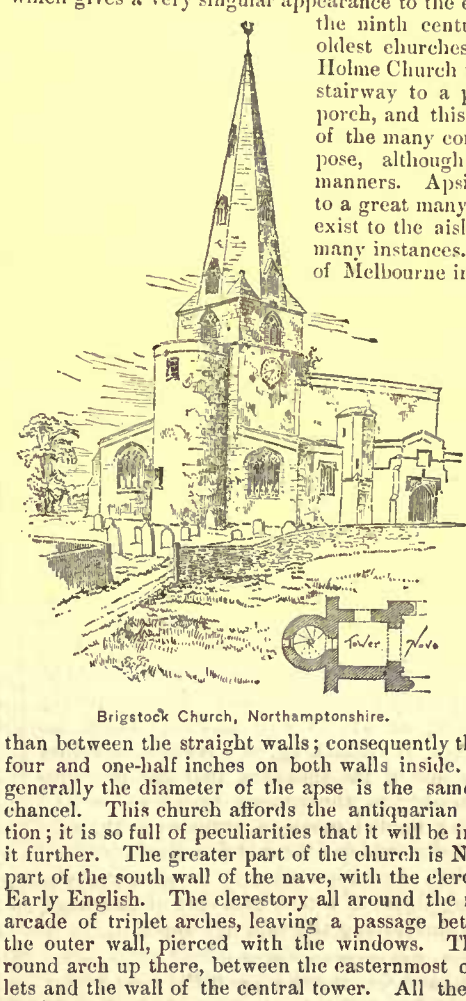
The side aisles are continued eastward, beyond the chancel arch. The one to the south forms a chapel in its extension, belonging to the Saunders family, while the north aisle opens into the chancel with three arches. Beyond this again, adjoining the chancel, is a small chapel, nearly square. Garway Church, Hereford, has a narrow nave (without aisles) and a chancel. At the south side of the chancel is a chapel almost of the same size as the chancel, and opening into it with two arches. But the special peculiarity of this church is that the tower, a massive Saxon structure, stands away from the building, but is connected with it by a short passage and a door opening out of the northwest corner of the nave.



Garway Church, Herefordshire.

Of churches with circular towers, those at Edingthorpe, Norfolk, Brigstock, Northamptonshire, and Holme near Newark in the same county, may be cited as examples. Of the first of these, the tower is at the centre of the west end, outside the west wall. At the height of the nave roof ridge, the diameter is some feet less than at the base, and from this level the plan changes to octagonal, which rises to the height of about sixteen feet, and is roofed-in flat and unfinished. At Brigstock is a square tower at the west end, about fifteen feet square outside, capped with a spire, but against the west wall of the tower is a circular stair-turret, twelve feet in diameter, which gives a very singular appearance to the church. It dates from the ninth century, and is one of the oldest churches in the country. At Holme Church the circular turret is a stairway to a parvis over the south porch, and this serves as an example of the many constructed for this purpose, although treated in various manners. Apsidal terminations exist to a great many chancels, and used to exist to the aisles as well in a great many instances. The Norman church of Melbourne in Derbyshire had originally three apses at the east end, but none of them are standing, although their positions are plainly marked by the foundations and the broken stone of the old walls. A peculiarity of the central apse, that to the chancel, must be noticed: it is struck with a radius greater than half the width of the chancel, so that at the commencement of the apse the chancel is nine inches wider than between the straight walls; consequently there is a convexity of four and one-half inches on both walls inside. This is unusual, as generally the diameter of the apse is the same as the width of the chancel. This church affords the antiquarian the greatest satisfaction; it is so full of peculiarities that it will be interesting to describe it further. The greater part of the church is Norman, but the upper part of the south wall of the nave, with the clerestory on that side, is Early English. The clerestory all around the nave is formed of an arcade of triplet arches, leaving a passage between the arches and the outer wall, pierced with the windows. There is a diminutive round arch up there, between the easternmost of the clerestory triplets and the wall of the central tower. All the caps in this arcade are left unfinished except two; these are of quite plain mouldings, but were intended to have the characteristic nail-head cut under the abacus, for which a projecting ridge of the stone has been left; the two finished ones have it. The shafts are circular on the south side,


Edingthorpe Church, Norfolk.

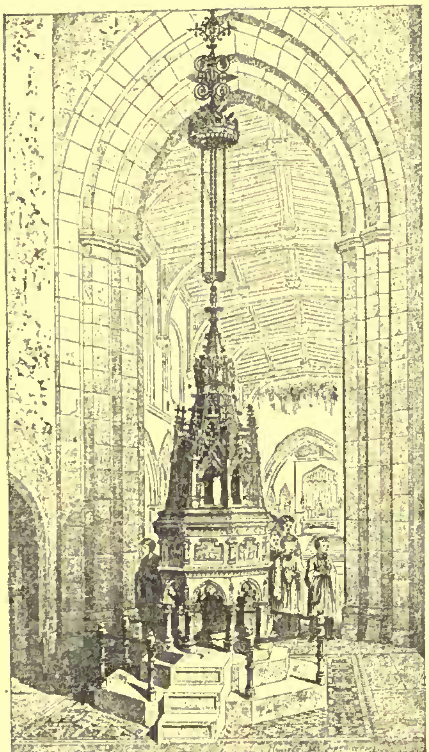


Brigstock Church, Northamptonshire.

[1] By R. W. Gambier-Bousfield, A.R.I.B.A., A.A.I.A.

but octagonal on the north, the latter supporting round arches. The arches of the central tower are only of the same height as those of the nave, so that the tower blocks the view of the chancel. Above the arch is a piercing of triplet arches, below the clerestory passage which runs across it. Now the church has a wooden roof, but originally it was stone, groined; evidence of this is discovered in the one springer that remains *in situ*, and the fact that the roof between the two western towers has its stone vault complete. A village church with three square towers is rare, but as this one is some miles from the railroad, and that only a branch line, it has escaped the notice of most travellers. These few examples will show how endless is the study of churches. Had we more space at our command, a very lengthy catalogue could be given and described.

THE CINCINNATI CHAMBER OF COMMERCE COMPETITION.


Baptismal Font St Mary's Church Watford Eng. Messrs. Christopher & White Archts.

THE competition for the new Chamber of Commerce building to be erected in this city has passed into history and will always be remembered as an oasis in the architectural desert of competition. Its history goes to prove that where committees charged with large public improvements go to work honestly, and with fair minds and unbiased judgment (not to mention an open pocket-book) they can command the best architectural talent of the country. A review of this competition will no doubt be appreciated by the fraternity.

The building site is on what is probably the most valuable corner in the city, to wit, Fourth and Vine Street, at present occupied by the old post-office, which is to be torn down. It is one hundred feet on Fourth Street and one hundred and fifty feet on Vine Street, and has a narrow street in the rear, parallel with Fourth Street. The rear street is about twelve feet below Fourth Street. On this lot the Chamber of Commerce desire to erect a building, completely fire-proof, suited to their needs and to afford also some revenue.

The committee decided to have a limited open competition for the building, and invited six architects, to wit, J. W. McLaughlin, Samuel Hannaford and A. C. Nash of Cincinnati, H. H. Richardson of Brookline, Mass., G. B. Post of New York, and Burnham & Root of Chicago; each of these was to be paid five hundred dollars for his sketches, and then the gates were thrown open to the whole architectural herd, that all might come in and browse. The compensation of the successful competitor was fixed at the rate set forth in the Schedule of the American Institute of Architects, the limit of cost being fixed at five hundred thousand dollars.

Every one of the six invited and eight other architects submitted designs. The designs were submitted June 1, and by the 8th it was known that the design of Mr. H. H. Richardson had been placed as most meritorious, and on the 11th all the designs were put up in the Chamber for public inspection, which was the first that any one of the competitors saw of the efforts of his fellows; and after a careful review of the exhibit, it is not strange that the committee arrived at the conclusion they did, as without doubt it is the most meritorious of the designs submitted. It has the handwriting on the wall; you know at a glance that it is Mr. Richardson's — it is broad, bold and simple. Of course it is Norman, or rather Romanesque. The drawings are clean and sharp.

Mr. Richardson did what no other designer did. He set his Chamber floor back about three feet on both Fourth and Vine Streets, on account of the round towers; in fact it was in order to make these round towers that this was done. These towers mark the four corners of the building, and do not extend as high as the main roof. The entrances are on the west side of the Chamber and communicate with the three streets.

The hall is 68′ x 140′, or 10,640 square feet, without a column, and lighted from three sides. One peculiar feature, and one that will probably be changed, is that these round bays on the Chamber floor have not a single window. There are only three floors for offices, each containing seventeen offices of various sizes, all opening on to a large central court. The stairs and elevators are quite a long distance (extreme west side) from the offices, and indeed this is a fault with nearly all the designs, and one that seems could not be overcome because of the nature of the problem.

Leaving Mr. Richardson, we come to "*Hugo*," Mr. James W. McLaughlin, whose design as to exterior is so very much given to backsets and offsets and outsets, that it certainly presents a new and novel appearance. It is Romanesque, but nevertheless it is McLaughlinian. He gives a chamber of 10,164 square feet, lighted from Vine and Baker Streets, with clerks' and superintendent's offices in front. Valuable front room is wasted for coat-rooms, lavatories, etc. The elevators are well placed as to location in building, but badly as to the Chamber. No stores on the ground floor. Interior of Chamber would be very imposing. Three stories above Chamber, of seventeen offices each. Good arrangement.

"*Difficilia non deterrunt*," Mr. Samuel Hannaford. Entrances in centre of both Vine and Fourth Street. Too much waste space for halls, etc. on the first floor. No stores. Stairs and elevators well placed. Chamber floor 74′ x 145′, without columns. Mr. Hannaford submitted two different Chamber-floor plans, the only difference being that "*B*" (which is perhaps the best one) has additional room for officers projecting into the Chamber. Four floors for offices, of fifteen offices each, well arranged but deficient in having only one elevator. Best colored perspective. Exterior Romanesque and very good.

"*Ceres*," A. C. Nash. Too much waste space on ground floor for vestibule, stairs, etc., which take up three-fourths of entire Fourth-Street front. No stores, but offices, on this floor. Excellent arrangement on second floor for offices, elevators, stairs, lavatories, etc. Chamber 93′ x 103′. This plan has what no other plan has, *i. e.*, projecting bays along the Vine-street front, adding floor-space and good effect to the Chamber. The offices above the Chamber are perhaps the best arranged of any in the exhibit, as they all open on to a central court and are easily reached from elevators and stairs, which are placed at the northwest and southwest corners of the building. There can be no doubt but this separating the stairs and elevators is a decided fault, and one that applies to at least one-half of the designs submitted. To get the full benefit and use out of such expensive and useful things as elevators, they should be kept together. The exterior is carefully and laboriously studied out, and displays much thought and careful workmanship, but is of a nature that would of necessity require too much sheet-metal of some kind, and is, moreover, too pronounced as to ornamentation.

"*Star*," Burnham & Root of Chicago, presents a decidedly Gothic appearance, with very little rental space; small stores on first floor, and only one floor for rental above the Chamber. Main entrance west side of Fourth Street, with a minor entrance from Vine Street. Elevators and stairs well placed at main entrance. Chamber 96′ x 112′, with only four columns, one near each corner. Officers' quarters well arranged, but too small.

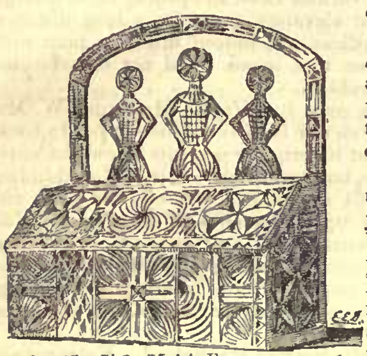
"*In me spes omnis*," Mr. George B. Post. Entrance from Fourth Street, and also from Vine and Baker Streets. Urinals, lavatories, coat-room are all on the first floor; also telephone and telegraph, all of which takes nearly one-half of space; balance of space well arranged for rental. Chamber 95′ x 95′. Officers' quarters ample and well arranged, and with additional telephone, telegraph, and lavatory conveniences. There are eight heavy piers in the Chamber, supporting the office floors above, and also a dome fifty-seven feet in diameter and placed, or rather out of place, to the west and centre of the Chamber. Three floors above, of seventeen offices each, well arranged, but a good ways off from the stairs and elevators at southwest corner of the building. The exterior has a large, massive tower over main entrance on Fourth Street.

Having mentioned the six selected architects, it would be superfluous to go into the other eight, as they differ only as regards minor detail. There was one submitted, however ("*Argo*," Mr. Bruce Price) whose exterior was worked up in a "sort of a kind of a" mediæval style that is extremely pleasing to the eye, and although the tower was very large in proportion to the building, yet it looked all right and was not wasted. His Chamber, however, was too small, and that settled it. "*Argo*" would certainly stand second, however, as to elevations.

Taking the plans altogether they make a creditable showing for the profession, and not one plan was submitted but showed great care and study, and while of course fault could be found with each one, yet each had its corresponding bright side.

St. Paul's Queen Anne Statue. — The estimates for a new statue of Queen Anne, as well as for the repair of the old one, which stands before the west front of St. Paul's Cathedral, have been sent to the corporation by various sculptors, and also by Messrs. Mowlem, contractors. The sculptors who were invited to compete included Mr. Macarthy and Mr. Fontana, besides the four we previously mentioned, viz., Messrs. Birch, Belt, Sheldon, and Lanteret. The corporation have voted a sum of £1,800 to defray the expenses, but, having regard to the importance of the work, it is believed that that amount must be exceeded. The corporation have not limited the sculptors as to time, but it is considered likely that the new statue may be completed and the old one repaired within a period of two years. The City Lands Committee are sparing no pains to secure the successful execution of the work. — *London Daily News.*

A METHOD OF AMELIORATING ONE FORM OF THE SMOKE NUISANCE.



'Old English Knife Box. brought over in the May-Flower. from Collection of the late Mr. E. G. Shaw. N. Beverly. Mass:

A NEW and interesting application of electricity, in a somewhat unexpected direction, has formed the subject of some recent investigations by Mr. Alfred O. Walker, of Chester [England].

Our readers may have noticed, in the autumn of last year, reports of a lecture read by Professor Lodge, of Liverpool, on the subject of "Dust." Papers were first read by Professor Lodge in this country, and the subject was afterwards more extensively dealt with in a lecture which he delivered at Montreal, during the meeting of the British Association.

In the course of these lectures the professor brought before his hearers the curious observations which he had made as to the effect of a discharge of high-tension electricity from a point, or points, into glass jars or other vessels containing dust of any kind in suspension. He also made interesting and striking experiments illustrating his remarks. Thus, if a bell-jar be filled with a dense smoke of magnesia by burning some magnesium wire inside it, a very long time elapses before the magnesia settles out and leaves the glass clear of smoke. But if a metallic point be introduced into the jar, connected by a wire to one of the poles of a good frictional, or induction, electric-machine, it is only necessary to set the machine to work, and almost instantly an extraordinary effect is observed inside the bell-jar. The magnesia smoke commences to whirl about and then forms itself into large flakes and strings which rapidly settle on the bottom and sides, leaving the jar perfectly clear of smoke. What would have taken several hours to settle in the ordinary course is completely cleared and deposited in a few seconds. The same effect is produced if the jar is filled with any kind of smoke, that from thick paper, or from a cigar, being acted upon exactly in the same manner as the magnesia. Professor Lodge told his audience that he and his assistant had made experiments on a very much larger scale than those in the glass jars. Rooms had been filled with dense smoke and rapidly cleared in the above manner.

A report of one of these lectures appeared in our contemporary, *Nature*, and was read by Mr. A. O. Walker. This gentleman is one of the partners in the well-known firm of Walker, Parker & Co., lead-smelters and manufacturers, and it at once struck him that in these observations and experiments of Professor Lodge might be contained the means of solving one of the principal problems with which a lead-smelter has to deal, viz., the condensation of the "fume," or volatilized lead from the furnaces. Various forms of apparatus have been from time to time proposed as "fume condensers," but with little or no success, the best results being so far obtained by passing the fumes from the furnaces through long flues and chambers. At the large works belonging to Walker, Parker & Co., at Bagillt, in North Wales, the flues and chambers have a total length of over two miles, and still the condensation and deposition of the lead fume is far from complete.

Mr. Walker at once communicated with Professor Lodge on the subject, and the matter being considered very promising, it was decided at once to try experiments on a practical scale. These were carried out by Mr. Walker at the works at Bagillt, with the assistance of the manager, Mr. W. M. Hutchings. Professor Lodge himself gave scientific advice and assistance on special points. The results of the experiments, which were carried on during many weeks, were extremely satisfactory, and fully bore out Mr. Walker's hopes and expectations.

By means of large casks a wooden flue was constructed at right angles to one of the main flues of the works, and with a damper on the main flue it was possible to make any required amount of the fumes from a group of furnaces pass into and through the wooden experimental flue. This latter was provided with glass windows placed opposite one another for the purpose of observation. It also had dampers by means of which it could be filled with the furnace fumes and then closed at both ends, so that it formed a chamber representing the professor's bell-jars on a very large scale.

The electric-machine employed was on the Voss system, the glass disc being eighteen inches in diameter. It was worked in a small shed erected close to the experimental flue. One pole of the machine being connected with the ground, the other was connected to an arrangement of metallic points placed inside the flue, and exactly between two of the windows above mentioned. A well-insulated copper wire led from the pole to the top of a stout brass rod, which was fixed in the top of the flue, projecting some distance above it, and reaching so far into it as was necessary to sustain the discharge points in the desired position. This brass rod was fixed inside a glass tube of considerably larger diameter, in order to insulate it where it passed through the top of the flue. During the experiments several different arrangements of discharge points were used, as for instance a brass ball having spikes projecting from it all round, a ring with spikes fixed upon it pointing in all directions, a cross studded with spikes in a similar manner, etc.

The electric-machine, being kept dry and warm in the shed, worked in a very satisfactory manner during all weathers, giving sparks some four inches in length.

The first experiments tried were upon the lead fume in a state of quiet; that is, the flue was filled with fume by allowing a strong current of it to pass through from the main flue, and then simultaneously closing the inlet and outlet dampers. The fume thus inclosed in the chamber, when viewed through the windows, appeared as a very dense fog or mist. Left to itself it took many hours to deposit. But as soon as the electric-machine was set to work, the same action took place as with the magnesia in the bell-jar. Through the windows could be observed the same whirling movement around the discharge points, and in a few seconds the fog was seen changing into little flakes, like snow-flakes, which rapidly flew to the sides of the chamber, and were there deposited, till in an incredibly short time the "fume" had entirely disappeared from the atmosphere of the chamber, which was as clear as before the fume was let into it.

Further experiments were then tried as to the action of the electric discharge upon the fume in rapid motion as it is in the flues of the works. The damper in the main flue being closed, the whole of the pressure of furnace gases was turned through the experimental flue and allowed to stream out into the air. Then the electric-machine was worked as before. No effect could be seen through the windows because the rapid current swept the fume onwards too fast to allow of any change being observed at that point. But at the outlet into the atmosphere, a few seconds after the discharge of electricity commenced, the effect was again very striking, the issuing fume again changing from fog into flakes. A glass plate held in the current before the discharge from the machine began, was only coated, after considerable time, with a thin film. A similar plate held in the current during the working of the machine was instantly coated over with flakes and large separate specks of fume. So much was the fume agglomerated by its passage past the discharging points, that on some occasions in perfectly calm weather some of it would fall to the ground immediately on leaving the exit opening of the flue. In short, the series of experiments proved that what took place under the bell-jar took place equally in the flue of a smelting-works, with all the attendant circumstances of heat, moisture, and acid vapors.

The trials of various arrangements of discharge points seemed to show that, within certain limits prescribed by the power of the machine in use, the more points employed the better was the result, the points being spread as uniformly as possible over the cross-section of the flue through which the fumes are passing.

On the strength of the satisfactory results above stated, Mr. Walker decided upon taking measures to apply this new process of fume condensation on a full working scale at the Bagillt Works. The necessary plant is now in course of erection, and nearly completed. The electric-machines used will be on the Wimshurst system, with discs of five feet diameter. Two such machines have been constructed specially for the purpose by Mr. F. J. Cribb, engineer, of Chester. They will be driven by a small steam-engine, the whole plant being placed in a small building close to the main flue of the works, through which passes all the gases and "fume" from nineteen furnaces.

Mr. Walker proposes to extend the process in England and most European countries and in the United States. It is intended to apply it to other branches of metallurgy, besides lead-smelting, as, for instance, the condensation of zinc oxide in the manufacture of zinc-white, and the condensation of arsenic. But its principal field of usefulness will doubtless be in lead-works, where so far all the proposed systems of condensers have either failed outright, or proved so costly to erect and to work that the very imperfect results obtained did not render it worth while to continue their use.

The outlay for the requisite machines, etc., will be a very moderate sum, and the cost of running the apparatus even for large works will be limited to the wages of one man per twelve hours, and fuel for a boiler to develop the insignificant power required to drive the Wimshurst machines. There will be little chance of anything getting out of order, and in case a temporary break-down of any kind takes place, the work of the furnaces will be in no way interfered with. This is perhaps the greatest recommendation of this process in the eyes of managers of works. Any one who has run a works, the draught in which depended on mechanical arrangements, as is the case where fume is to be condensed by sucking or forcing through water, knows what a constant succession of break-downs and stoppages has to be encountered. Mr. Walker's process causes, of course, no interruption of the proper draught in the flues under any circumstances. Fume which is now carried forward through the longest flues and escapes from the chimney, will be rendered so much denser by the action of the electric discharge that it will not be carried anything like so far by the draught, and will rapidly deposit itself. Thus works which have now considerable flues may look forward to obtaining a greatly increased yield of condensed fume, while others which have not as yet considered it worth while to erect flues for the partial condensation to be obtained by their use, will probably find it advantageous to do so, when by so simple a process as the one in question they can obtain from a moderate length of flue a greater yield than could otherwise be looked for from a very great length.

When Professor Lodge was carrying on his experiments on "dust" from a purely scientific point of view, it is not likely that he had any idea how soon his results would become of practical commercial

value; and the speedy turning to technical utility of these experiments, owing to the sharp-sightedness of Mr. Walker, is but one more of the many instances demonstrating the unexpected and often surprising manner in which "pure science" of one day may be very valuable "applied science" of the next. — *Engineering.*

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

CHURCH OF ST. PIERRE, CAEN, FRANCE. AFTER AN ETCHING BY DELAUNEY.

OF all the charming memories that one carries with him in leaving Caen, none is more vivid than that of the grace and elegance of the tower and spire of the Church of St. Pierre, near the middle of the town and so well placed in the crowded little city that one can take it all in, as is the case with few other of the noted buildings there. It is often a subject of amusement to the writer to remember that he was so absorbed in appreciating the beauties of the spire that he absolutely forgot that there was another feature of the building equally famous — the Renaissance apse — and so he did not use a portion of the few short hours he could spend in the place to walk round to the rear of the church, and the interior of the building was so disappointing that his investigations did not carry him beyond the nave. Built about 1308, the tower and spire have ever since been celebrated, by French writers at least, as *belle entre les plus belles flèches.* It rises to a height of about 227 feet, the spire being built entirely of stone eight or nine inches thick, the octagonal faces being pierced by forty-eight openings, which give a singular air of lightness to the whole. The apse, added in 1521, by Hector Sohier, an architect of the city, in spite of its profuse ornamentation, is extremely picturesque, and in its kind elegant; at any rate it has a fame quite as widespread as that of the tower. The nave and choir date from the thirteenth century, but as they were restored in the sixteenth much of what is disagreeable in them may be attributed to the restorer. The capitals of the nave-piers are more than ordinarily amusing, representing scenes from the fables, and the legendary tales and poems of the romancers mingled with some of questionable moral interest.

BUILDING FOR THE MUTUAL LIFE INSURANCE COMPANY OF NEW YORK, BOSTON, MASS. MESSRS. PEABODY & STEARNS, ARCHITECTS, BOSTON, MASS.

[Gelatine Print, issued only with the Gelatine Edition.]

THE walls of this building are of white Tuckahoe marble. The floors are marble-tiled throughout, and constructed with rolled beams and brick arches. The windows have iron sashes and shutters, and the door and window finish throughout is iron or marble or cement. The only wood used is for the doors, which are of mahogany. The steep roofs are covered with heavy red slate secured to iron purlins and cemented on the back, and the flats are covered with copper. The sidewalks are of bluestone. The building contains several costly bank vaults, and it is occupied by banks and offices of railroad and telephone companies and private offices.

NEW ENGLAND MUTUAL LIFE INSURANCE COMPANY'S BUILDING, BOSTON, MASS. MESSRS. BRADLEE & WINSLOW, ARCHITECTS, BOSTON, MASS.

[Gelatine Print, issued only with the Gelatine Edition.]

THE building is of Concord granite, with Quincy granite base. Fire-proof construction throughout: Plaster-block partitions; and floors, brick arches and iron beams. The basement contains safety vaults, which are fire and burglar proof, the air-spaces surrounding them being caged in railroad iron. The roof is of iron construction entire. All door and window architraves are of Keene's cement, moulded. The boilers and engines are located outside of the building proper. The stairways are of marble and iron. The office of the Insurance Company is on the second story. The dadoes are of marble and Keene's cement, and all columns, etc., are covered with the same material. The floors are hard-pine, and marble tiles are used for corridors. All ceilings are wire-lathed. Thorough system of steam heating and ventilation.

VIEW IN THE COURT-YARD OF THE PALAZZO VECCHIO, FLORENCE, ITALY.

THIS view should have been published as an illustration to the article on the Palazzo Vecchio, which appeared in our last issue, but as we were not satisfied with the proof, we preferred to withdraw the plate rather than send one out which was inferior to the average of its fellows. Our readers may find it worth while to turn back to the last issue for the sake of the reference there made to the architecture of this portion of the building.

IL BARGELLO, FLORENCE, ITALY. THE INTERIOR STAIRCASE.

THIS building, commonly known by the title given above, also known as the Palazzo del Podestà, was built about the middle of the thirteenth century, as the official residence of the chief magistrate of the city. It has shared the vicissitudes which fell to the share of other famous buildings of mediæval Italy, and has undergone alterations and restorations at sundry times. Its present duty is to house a portion of the famous art collections of the city, and is gradually becoming known by the title of the Museo Nazionale.

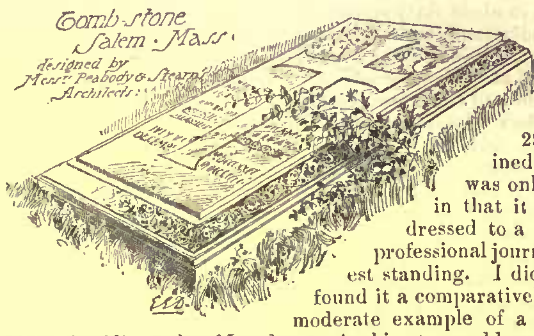
A ROW OF SMALL HOUSES. MR. CHARLES A. GIFFORD, ARCHITECT, NEWARK, N. J.

IT is intended to use rough brick in red mortar, and brown-stone for finish. The cost will be about $4,500 for each house.

HOUSE OF R. S. BARNES, WASHINGTON, CONN. MESSRS. ROSSITER & WRIGHT, ARCHITECTS, NEW YORK, N. Y.

ON POINTS OF VIEW AND METHODS OF CRITICISM OF PUBLIC WORKS OF LANDSCAPE ARCHITECTURE. — II.

BROOKLINE, 1885.

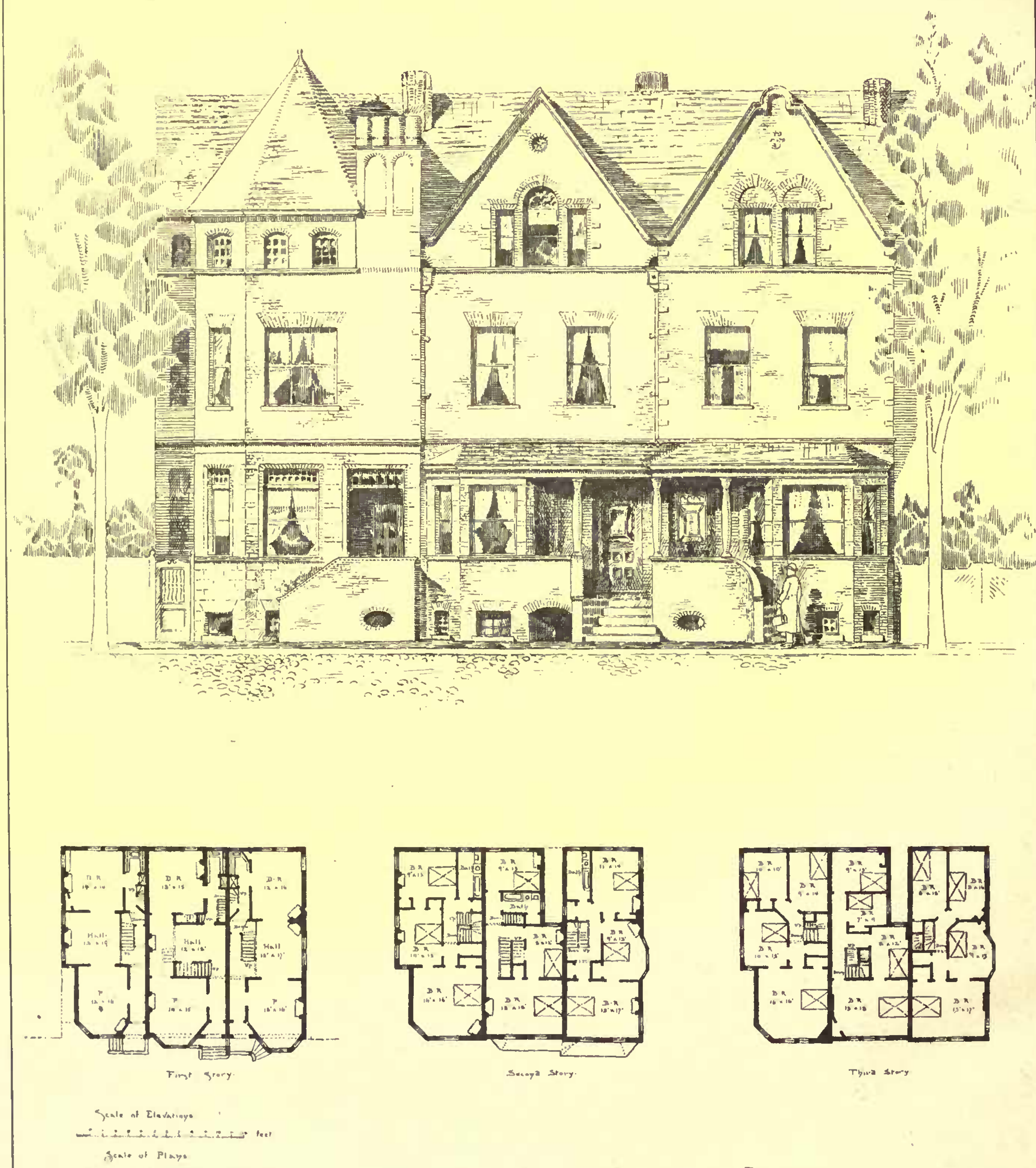


IN a former communication (*American Architect* No. 495, page 295), I examined a letter which was only remarkable in that it had been addressed to a technical and professional journal of the highest standing. I did so because I found it a comparatively modest and moderate example of a class of criticisms of public works of Landscape Architecture, addressed to the public through the press and otherwise.

The leading traits of this class I indicated to be, first, that they were based on impressions of the subject of criticism which were the result of hasty, superficial and inexact observation of fragments of incomplete work; second, that they represented no adequate consideration of designed results to be reached by growth after a period of years through persuasion of nature in a choice of the ordinary ways of nature; third, that they confused one purpose or motive of design with another, or with several others; fourth, that they failed to recognize that the most important element of professional education of a landscape architect is that obtained through special familiarity with, and enjoyment of, the beauty of various aspects of nature, and assumed that the employment of professional education and experience in the conduct of the class of work they undertook to criticise could only lead into narrow, rigid, artificial channels of unnatural and depraved taste.

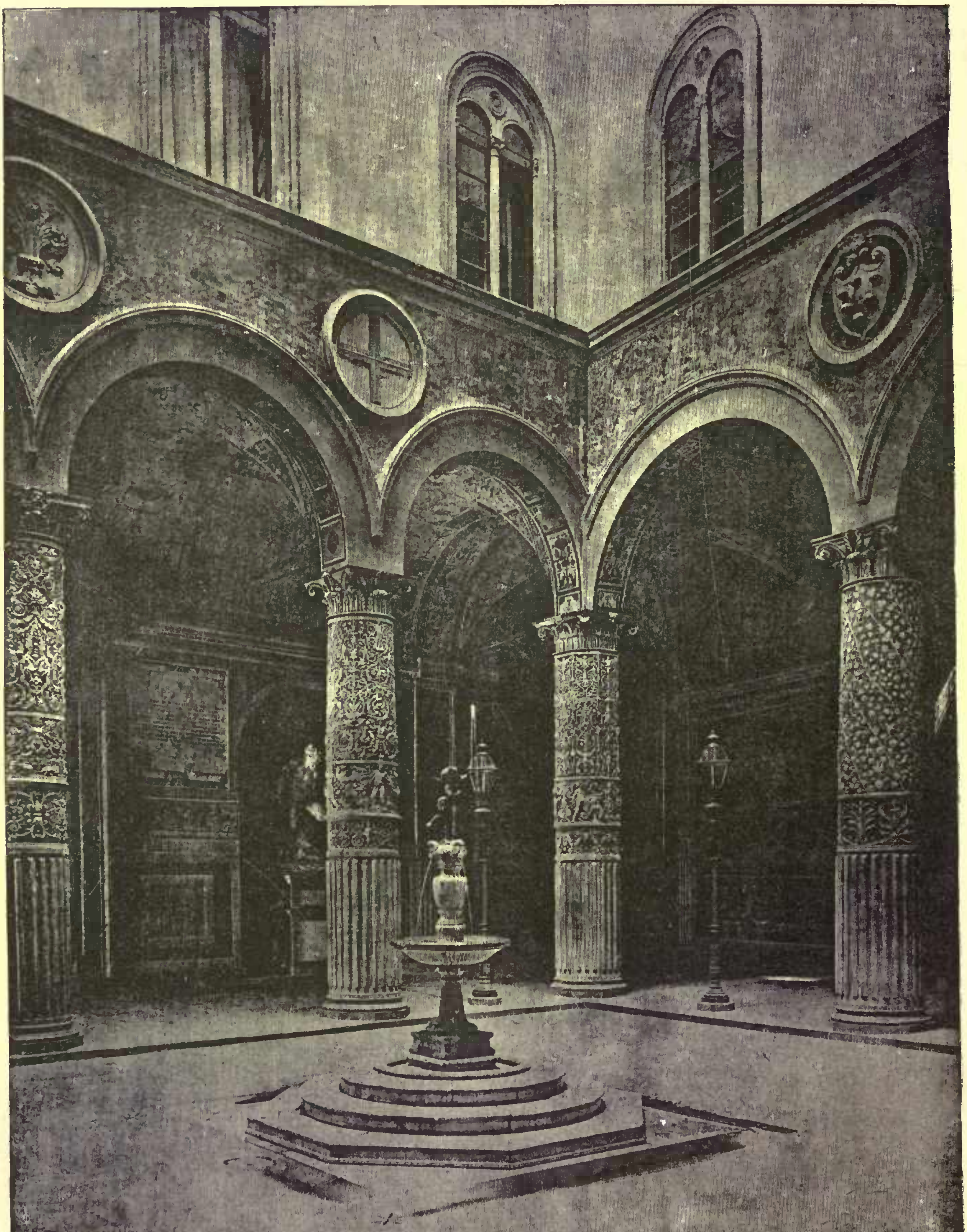
I wish now to narrate a few incidents in further illustration of the subject, and to add, perhaps, no more than a single example (since one of conspicuous character will fully answer the purpose) of the harmful results to public interests of such misled essays in criticism. I shall draw upon my own experience because of my familiarity with the facts of it. But let it not be supposed that the custom is of recent origin or that my experience is peculiar. Nearly forty years ago the venerated Downing, acting under instructions received direct from the President, removed a few trees, which, in his judgment, were damaging a public ground in Washington. Upon this a gentleman asked in the Senate Chamber, "Who is this man Downing? Is it the famous Major Jack Downing?" his object being to ridicule the idea that a man whose high standing in his profession was recognized by all who could speak with authority throughout the world was more competent, or to be safely entrusted with larger discretion than Tom, Dick or Harry. The logic of the position would lead to the conclusion that no tree on a public ground could be properly removed except by special act of Congress. Illustrations of the same frame of mind are constantly appearing. Since your correspondent's letter was printed, my name, for example, has been telegraphed through the land, not in the half-railing way of his use of it, but as might be that of a wretch, guilty of an atrocity so barbarous that its occurrence humiliates the nation. This for an act of professional duty as surely imperative as the amputation of a man's limb has ever been with a surgeon — an act contemplated and provided for ten years before; fully and specially sanctioned by those to whom I was officially responsible, and a temporary delay of which had led me to be remonstrated with by the highest authority in the country. For like offences against common-sense, I have been publicly denounced as a Vandal hundreds of times. It stands on the printed record that I have been given this title on the floors of Congress, after having been declared ignorant of the simplest duties of my calling, and told that my most important work would disgrace the back-yard of a pioneer settler.

The first work in any ground, the surface of which requires modification, is that of taking off the soil and storing it in compact mounds until it can be returned to its place after a change of the subtratum. It has more than once occurred that gentlemen, seeing these mounds half made, have rushed to a newspaper office to advise the public that the work was under no competent direction, for it was not at all in good modern gardening form to lay out such stiff, formal beds as they had seen making. Once the mayor of a city called the attention of the council to reports of this character. A committee of investigation was formed, it held several sessions, examined a number of witnesses, none of whom were connected with the work; finally, I



— Row of Small Houses —
... 57 ft. – lot ...

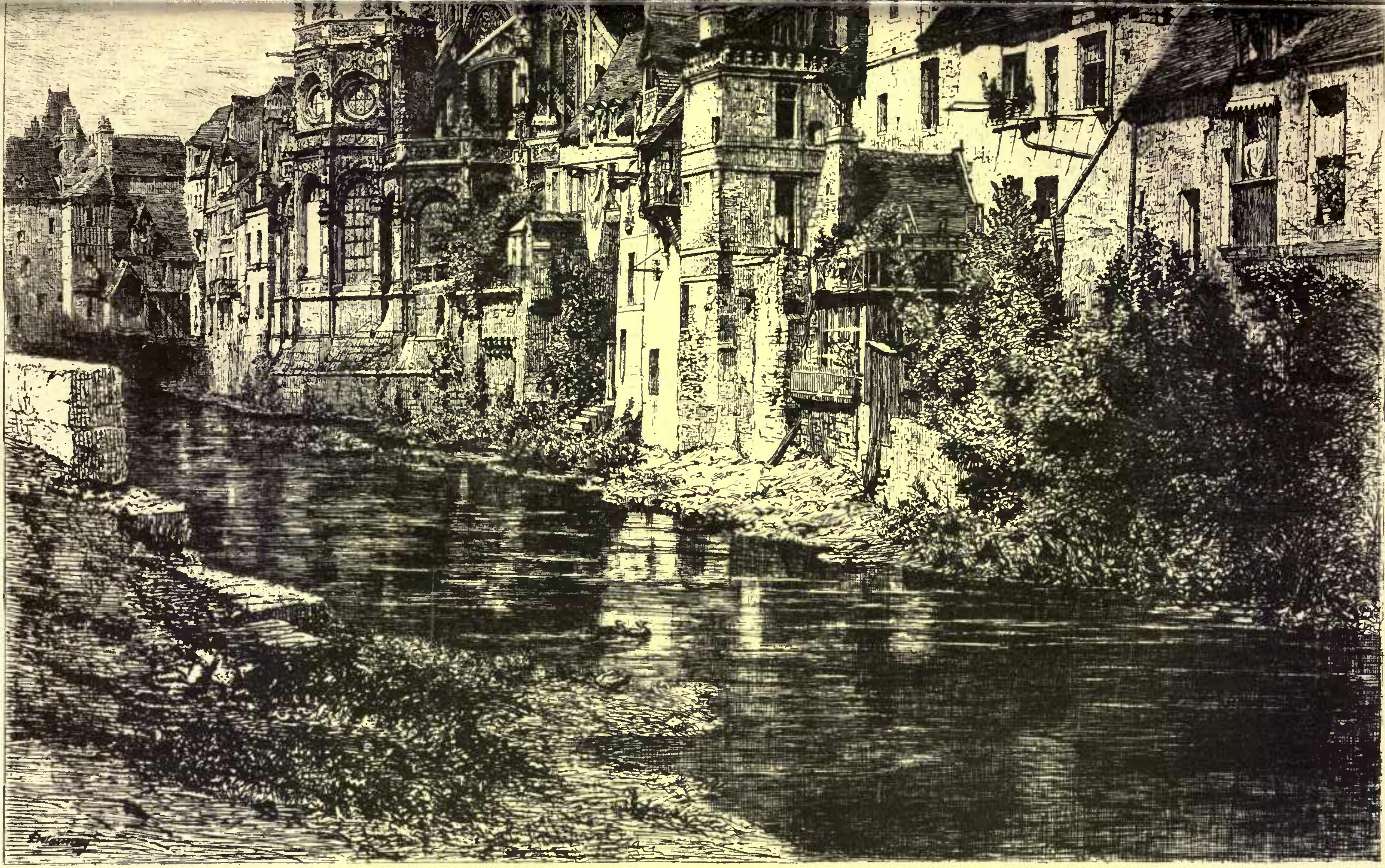
Charles A. Gifford : Architect
No 764 Broad St. Newark N. J.



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Court-Yard, Palazzo Vecchio, Florence, Italy.





À Paris chez l'auteur, 39 rue de Seine

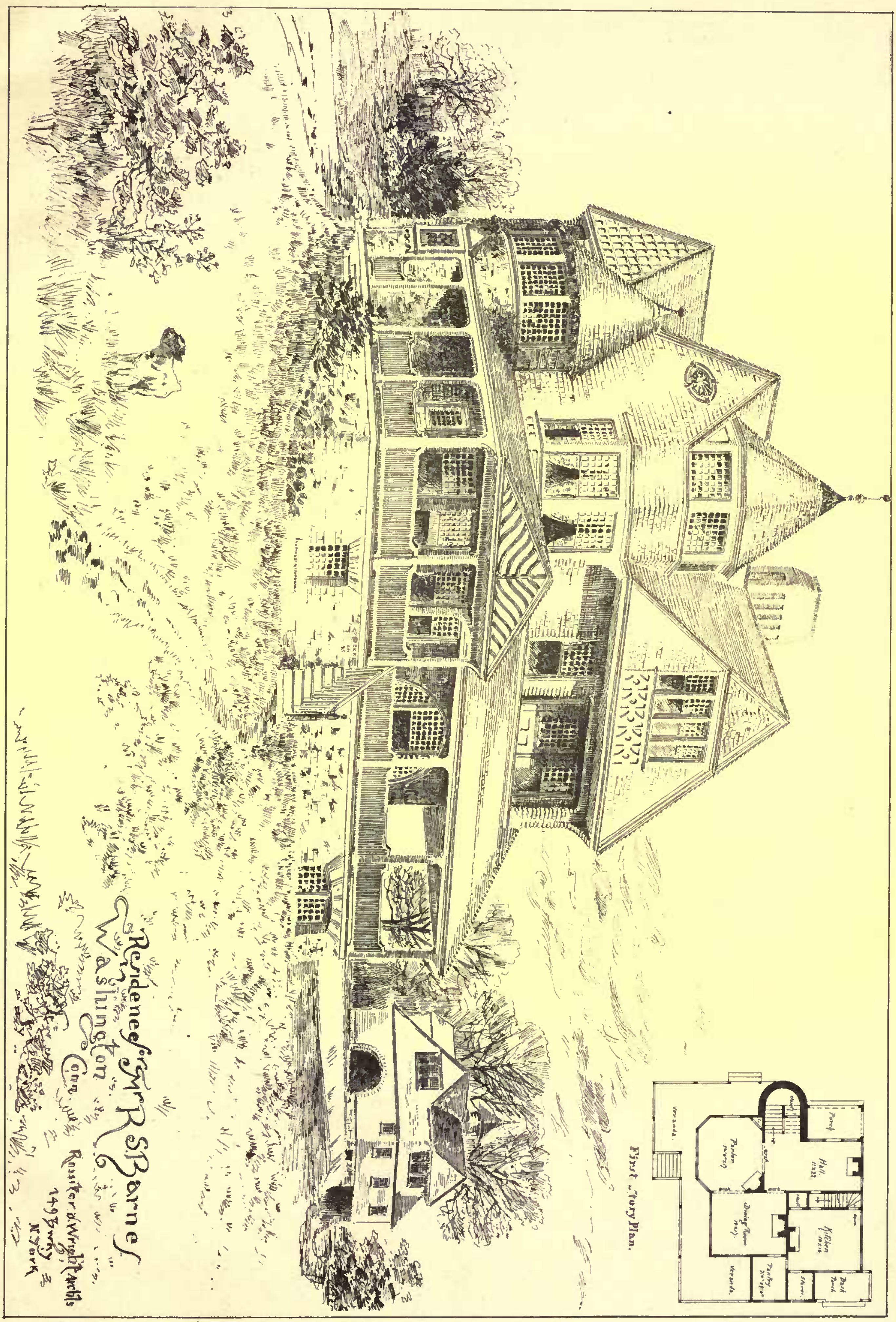
EGLISE SAINT PIERRE A CAEN

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Il Bargello, Florence, Italy. Interior Staircase.

American Architect and Building News, June 27, 1885 No. 496



suppose, came to the ground to look for itself, and let the matter drop — making no report.

Once a letter appeared ridiculing certain work in progress, upon grounds evincing a wrong-headed idea of its motive. Shortly afterwards I was advised by telegraph to see a legislator who, it was said, had the power and the intention to prevent any appropriation for the work until a change of plan was made in the particulars referred to. I hastened to the place, making a journey of a thousand miles for the purpose; found the gentleman in question and asked him to visit the ground with me. He said he could not, as he had to go at once to an office which he named. "You will pass through the ground in going there, and if I may go with you it will not detain you two minutes to have a matter set right in which I am told you have much interest." To this he consented, and when we reached the locality I began to show the necessity of the course adopted. Before I had half done so, in about sixty seconds, he interrupted me, saying: "Oh, I see you understand the business better than I do. I never thought there was so much in it. Go ahead and I'll support you."

The marvel of such experiences, of which I could relate many, is that intelligent and educated men should be so unready, of their own motion, to reflect "that an artist *of whatever denomination*," as Charles Dickens once said, "may perhaps be trusted to know what he is about in his vocation, if they will concede him a little patience."

But if this is marvellous, there is a thing more so. It is the want of root in the mind of the notions upon which the most sensational "criticisms" are uttered. Once a man wrote to a leading newspaper that he had seen in a place named an impossible object. He was known, was asked to look again at the place and the impossibility pointed out to him. "Obviously so," he said, coolly, "it must have been an optical delusion," but no correction of the report was ever made.

But of the shallow-rootedness of the sentiment, that appears so firmly established in many of the class of criticisms I am explaining, perhaps the best illustration appears in the fact that they have often been uttered by men who were at the time on familiar terms with me; to whom it would have been much easier to ascertain the facts and motive of the work criticised than to have written to a newspaper. It has happened that the authors of more than one of the reports to which I have referred in this letter have sought my professional advice for their private affairs, acted upon it in unquestioning faith, and expressed satisfaction with the results.

I do not know that my personal fortunes have ever been at all affected by this class of shallow, light-hearted but exciting criticisms. Those to whom I have been directly responsible, if they have not always fully sustained me and seen me through, have invariably expressed their confidence in me and their belief that I was right. But as to the effect on the interests of the public, I will refer to a case of which the essential facts must be generally known, so much have they, bit by bit, been publicly narrated.

In a daily paper of the largest circulation in New York, between 1850 and 1861 (more or less in others), a series of complaints were published upon the sparseness of the planting of the Central Park. For several years afterwards the entire work was extravagantly praised and all concerned in its design and management were set on a hazardously high eminence. Later, a systematic thinning of the plantations, much too long delayed, was entered upon; criticisms and protests then began to appear, and before long an excitement was worked up, which became violent when the vandalism was witnessed of taking out some of the larger trees — mostly cheap foreign trees, originally planted as nurses and for temporary effect, and in no way of permanent value, yet sure to be destructive to the designed sylvan effects if allowed to remain. This violence did not spend itself in the Press, it led on, in some cases, to proceedings of an almost riotous character, laborers being stopped at their work by gentlemen who left their carriages for the purpose. A man directed to fell a tree answered, "I beg your pardon, sir, but I hope you will excuse me. I really dare not do it."

The Commissioners professed to be satisfied that their professional advisers knew what they were about in their vocation, yet, after many cautions, were constrained by political considerations, or by respect for what they were made to regard as an irresistible public sentiment, first, to withhold the means necessary for proceeding with the work, and, at last, to forbid the removal of a single tree except the assent of a majority of their Board had been obtained and formally recorded. This was practically a prohibition of all thinning of the plantations and was intended to be. What has followed? precisely what the Commissioners were over and over again warned would follow. For several years past I have seen no expression of dissent from the judgment expressed by many competent critics, that the value of this park, costly beyond parallel, has been cut disastrously short of what it was designed to be, and in its early stages fitted to be, by the course taken. It is too late to remedy the evil, and I have seen earnest appeals to those in charge to break into the plantations where breaks would only work to a more disastrous frustration of the design than has yet occurred.

The first step taken in the construction of the Brooklyn Park was the removal of one-third of the trees found growing upon the ground and the blazing of half the remainder as not to be reckoned to remain permanently. Later, some of the trees designed for permanence were subjected to such treatment as led to public denunciations of the ignorance and barbarity of those responsible for it, giving the Commissioners much concern and leading to earnest cautions. Three years afterwards the professional superintendents of the work invited a close examination of the results of disregarding the clamor of the Vandal-hunters and were thanked for their persistence. Let any competent critic examine the park now and ask whether a little more vigorous and sustained Vandalism would have been a misfortune to the city? F. L. O.

THE BERLIN COLLECTIONS. — I.

BERLIN.



"LA PENSÉE." CHAPU. Sculptor.
Grand Prize awarded, Paris Salon. – 7/7.

FIFTEEN years ago any one might have foretold that the establishment of the empire would mean a vast growth in the importance of Berlin itself, as well as in the importance of Prussia and of Germany at large. But even the most sanguine local prophet must have been surprised at the rapidity of this growth, and still more at the variety of directions in which it developed. He could hardly have foreseen that the Berlin of to-day would be almost as different from the old Berlin with regard to its art-treasures as with regard to international politics or to the number of its inhabitants. But so it is; the student who "did" Berlin even ten years ago must do it all over again now, and will find a vast deal of work cut out for him. Not only have whole new quarters and suburbs sprung into existence, but great numbers of conspicuous public structures have arisen in the older streets, as a result of the centralization of political and military power, and the less complete but still remarkable centralization of Germany's intellectual and artistic life. Nor has governmental energy been confined to such semi-artistic, semi-utilitarian undertakings as these. Nothing is more remarkable than the clear-eyed policy which, amid a thousand other absorbing tasks, has seen that to enrich the local collections would mean to enrich the national mind and, no less, to enhance the dignity and the attractive force of the capital — nothing, unless it be the careful, judicious, yet unresisting and magnificently liberal way in which this aim has been pursued. Those who think of the German Government as pre-eminently devoted to the gospel of "blood and iron" will find a change in their ideas if they spend a day or two among the Berlin museums and compare them with what they were a score of years ago. And those who have been perplexed by the question how such institutions should be planned, subsidized and directed, will find an almost ideal solution of the problem in the annual reports of the Berlin authorities.

I will not here enter into details. I will only note that there is no necessity, as in England, for a fresh appeal to Parliament (and a consequent long delay even when the prayer is granted) every time that a large sum of money is desired. The endowments for salaries and running expenses are most liberal, and each department of the museums receives annually an important allowance, which is under the control of its own special director. Then there is a common fund whence, by consent of all the directors, any branch may be assisted if an occasion offers which its own coffers are incompetent to deal with. And, moreover, the Emperor and the Crown Prince seem always ready with their help when these sources fail, and the parliament always ready to act with them in subsidizing those researches and explorations which not only add lustre to the German name, but bring so much treasure-trove to the doors of the local museums.

Of course all this might be of small avail if the persons in charge were not supremely well fitted for their posts; but that they are so fitted is proved by the fact that the quality of recent purchases is even more remarkable than their vast quantity. Therefore it is interesting to note what sort of persons they are. They are not mere government officials, beaurocrats or financiers, not artists, not even enthusiastic, cultivated amateurs, but specialists thoroughly trained for just the kind of work required — students, antiquaries, critics of the highest standing. As connected with the museum of old pictures, for example, the earliest names we find are those of Waagen and Ruhmohr; and their successors have been of like stamp down to the present director, Julius Meyer. In some countries such intelligent supervision as theirs is lacking; in others there is but little money for spending; and nowhere but in Berlin, I think, is there that thorough, detailed organization which marks everything to which the German Government puts its hand. And nowhere else, moreover, is it an inherited custom that the members of the royal family should always take a generous personal interest in artistic matters. So it is but natural that the Berlin collections, a generation ago of but

secondary importance, should now rank among the finest in Europe, and should still steadily be enriching themselves by a flood of treasures drawn from France, from Italy, and especially from England.

The arrangement of each collection is as perfect as it could be, given the facts that the buildings erected in the earlier part of the century are not very well planned, and that some departments are already overcrowded. And the cataloguing bids fair soon to be the best in the world. Even now, with many amendments in immediate prospect, it is very satisfactory — judicious as to the kind and trustworthy as to the quality of the information it gives. The catalogue of the old pictures, for example, is by no means regarded as final, yet I can name no similar guide which is so helpful. Even in European galleries of the very first rank the catalogue often gives one but the scantiest amount of information, and this of a kind which, if collated with those outside publications that really embody the views of contemporary scholarship, proves to be marvellously antiquated and misleading. One almost comes at last to doubt on principle the attributions of all but the most world-famous pictures, and quite comes to feel that not truth and instruction, but the nominal glory of his collection, and the respecting of traditional errors and popular prejudices, have been the main aims of the average cataloguer. It is indeed a relief to find in Berlin a catalogue which has the savor of to-day, not of fifty years ago, which incorporates the criticisms of the most radical investigators — either boldly agreeing therewith or giving definite reasons for its disagreement, which immediately proves itself, in fact, a real *guide* to a real knowledge of the pictures on the wall. It is indeed a relief to consign to one's trunk those ponderous outside helpers which in Dresden, for example, had been found quite indispensable. The possession of trustworthy and intelligent catalogues is one of the consequences of having the right sort of men as directors, and it is a far more important consequence than even the acquisition of many novel treasures.

Let us look a little now at the various Berlin collections with an eye to the way in which they have grown of recent years. The collection of modern art has received but few additions, a fact which proves not want of interest but due discretion, since it is national, not international, in its scope, and since, therefore, few worthy aspirants to its honors exist to-day. Half a dozen good portraits, among them a magnificent Bismarck, by Lenbach; Makart's Caterina Cornaro, which has darkened dreadfully in its shadows, but still proves its author to have been the one great decorative painter whom Germany has ever produced; and an interior of an iron-works, by Menzel, are all the canvasses I need cite. But I wish our young painters in search of thankful modern subjects could see this last, so fine an example is it of how pictorial beauty as well as emotional impressiveness and intensity may be wrought from the most "realistic" theme, and by a method of simple representation, not of attempted idealization. Menzel's affinities are far more with the youngest French than with any German school, both technically and, one imagines, theoretically. And the fact seems all the more remarkable when one remembers that he is a very old man, who has lived through many changes of artistic fashion, and who once viewed and practised art in a very different, though always an admirable way. But on the whole I think the best modern work I have seen in Berlin is a life-size bronze statue representing the Victor of Marathon, which has lately been placed in the National Gallery, the work of Max Kruse, a young artist who also shows very little sympathy with the typical German schools. Perhaps I may find another opportunity of describing it; just now its extreme interest would lead me to undue diffuseness.

The museum of old paintings is the youngest of the kind in Europe, save only the National Gallery of London, and was one of the results of the patriotic reaction which followed upon the Napoleonic wars. In 1815 a small collection was bought in Italy, from the Giustimani family, but in 1821 the first great step was taken, by the purchase from the banker Solly, in London, of no less than six hundred paintings, almost all of very great value. Moreover, they were chiefly of one kind — Italian pictures of the fifteenth century — and the Berlin gallery thus gained the great attraction of having an important specialty of its own. In Vienna and in Dresden, for example, one studies the great Italian masters of the sixteenth century, and in Munich the early Northern schools; but Berlin is the only place north of the Alps where one can make acquaintance with the early art of Italy. It was an unusual taste in his day which led Mr. Solly to the formation of such a gallery, but a taste which has now become universal and is daily growing in strength. He seems to have cared for all *les primitifs*, indeed, for nearly all of his pictures which were not early Italian were early Flemish, and among these was a unique treasure of priceless worth — the marvellous pictures which formed the wings of the great altar-piece painted by the brothers Van Eyck for the Church of St. Baron, in Bruges, where the four central paintings are still preserved.

The admirable beginning thus made was steadily followed up. Very many pictures were removed to the gallery from the various royal residences; among them Rembrandts, Teniers, and other Dutch productions, and late Italian and French works, many of which had been bought by Frederic the Great. (Imagine the riches of the National Gallery in London, if the same public-spirited impulse had moved the rulers of England!) Many pictures were bought from the Reimer collection in Berlin in 1843, and others were picked up by Ruhmohr here and there, but it was not until after the Franco-German war that the Museum began to grow with really giant steps. The first of these was the purchase, for a very large sum, of the collection of M. Suermondt, in Aix-la-Chapelle, a veritable connoisseur's collection, that had long been famous, and that embraced chiefly Dutch works of the finest period — canvases by Rembrandt, Franz Hals (one of these a Hille Bobbe, like, but not identical with that in the New York Metropolitan Museum) and almost all the other representatives of the great portrait and landscape schools of the seventeenth century. Hence came also another wonderful Van Eyck, the portrait famous under the name of "*L'Homme a l'Œillet.*"

Of late many admirable Italian and a few French pictures have come to swell the list still further — a number of portraits by Titian, Bronzino and Botticelli (and among them family portraits, strange as it seems) from the Palazzo Strozzi in Florence; a very remarkable portrait by Agostino Carracci which quite upsets, or rather uplifts, all one's preconceived ideas connected with this name, so strong is it, so simple, so artistically realistic and so good in color; a Claude Lorraine, once in the Pourtalès collection; a Greuze, given by the Crown Prince and Princess; a beautiful portrait by Moroni and another by Sebastiano del Piombo; a marvellous little reliquary by Pinturicchio; Signorelli's superb "Pan with his Followers," believed to have been painted for Lorenzo de Medici, and a "Mary and Elizabeth" by the same master; an unusually fine Tiepolo from the Munro collection in London; an exceptionally good Verrocchio; no less than three Masaccios; an admirable Nicolas Poussin from the Sciarra Palace in Rome; and two pictures by Schiavone, of extreme interest as being among the earliest Italian examples of "independent landscape."

The fine Velasquez portraits of the Suermondt collection now have as companions a court dwarf, bought in Vienna, and a large portrait, supposed to be that of General del Borro, which was secured in Florence. This last is certainly one of the most astoundingly triumphant and one of the most instructive pictures in existence. I know of none which is its equal in proving that, in a work of pictorial art, the main factor is the quality of the art and not of the subject-matter. The model was a very tall and corpulent man with a huge protruding stomach and an almost porcine countenance. Yet with this theme Velasquez made a picture which is not only far from repulsive, but which is absolutely delightful and superb. And he did it without the aid of any adventitious accessories or any brilliant scheme of color, and just by emphasizing in a bold and direct way those personal peculiarities which a lesser artist would most certainly have tried to palliate. The general, dressed all in black, stands almost defiantly upright with one hand hanging by his side, his great body shown nearly in profile and its extraordinary contour distinctly relieved against a marble background with a single column. His head is a little thrown back and is turned so as to present a full view and a direct gaze. Close by his feet on the pedestal where he stands is tossed a flag which adds a note of brightness to the sombre coloring. The composition is thus of the simplest, and so is the illumination, which veils nothing and poetizes nothing. But the very simplicity of the pose, together with the character of the background, makes the portrait monumental in effect; and the very frankness with which the general carries his abnormal bulk is made to convey an impression of the most imposing personal dignity, while the station of his head and the glance from his little eyes, half-buried though they are in flesh, express power, majesty, I may say, to a degree which I think I have never seen equalled in any other portrait. The huge figure of the model seems an actual advantage — one cannot wish him more normal in his proportions lest he should be less unique in his magnificently placid imperiousness. I need not praise the handling or the color of the canvas since they show Velasquez at his best, but when I add that at first we hardly notice even such color and such handling as his — so overpowering is the general effect of the picture — the personality of the model it interprets from beneath its uncouth exterior — I think I am explaining that a great *conception* is the greatest of all things in art. Of course, though, it is impossible really to separate conception from execution — of course no brush but that of Velasquez could really have conveyed to our eyes the main idea which, I think, no one but Velasquez could have conceived.

Nor have the Teutonic schools been neglected among the recent acquisitions in Berlin. One notes, for example, a fine hunting-scene by Cuyp; a good Ruisdael; two more superb portraits by Franz Hals; and three important Rubenses. Another fine portrait has been added to the Terborchs of the Suermondt collection, and a Brauwer which is the only landscape of his that is known to critics. But a greater treasure than any of these, even, is a marvellous interior by Pieter de Hooch, whose works are comparatively rare and incomparably beautiful even among those of his own great generation.

Rembrandt has long been well represented in Berlin, especially in his earlier period; but here, too, recent acquisitions have been numerous and most valuable. Another early work has been donated by the Crown Princess, and a very late one purchased in Paris. Moreover, two years ago there journeyed to the borders of the Spree the superb "Susanna and the Elders" and "Vision of Daniel," once owned by Sir Joshua Reynolds, and these have within the last few months been followed by a "Joseph and Potiphar's Wife" which makes even their charms seem pale. This last is not yet catalogued, and all that the gallery attendants could tell me was that it, too, had come from England. When I saw it I thought I had never quite known Rembrandt before, and thought therefore that I had never

before seen on canvas the full results of what color and chiaroscuro together can accomplish — such depths of sun-streaked duskiness, such brilliancy of darkly glowing tones.

But the purchase which of all others has made the most noise in the world is that of Dürer's portrait of Holzchuer, also achieved within the last few months. Two other Dürers had preceded it at short intervals. One was a large half-length in water-color on canvas of a man with long black hair which came from the Hamilton collection where it was incorrectly called a portrait of the painter himself. Now it is tentatively designated as the portrait of a prince of the Saxon house. The other was the well-known head in oils, by some believed, by others not believed, to be the portrait of Dürer's friend, Jakob Muffel. It was originally in the Schönborn collection, was sold in Paris in 1871 to the Russian prince Narischkin, and in 1883 by him to the Berlin authorities, who had vainly striven for its possession twelve years before. But the last and greatest Dürer — *the* Dürer of Berlin and I had almost said of the world — is the portrait of Hieronymous Holzschuer. From the time of its execution it had always been in the possession of the Holzschuer family in Nuremberg, though loaned by them of late years to the local gallery. It seems perhaps as though they should have been loth to sell an ancestor painted by such a hand, yet who can blame them, since the bribe held out from Berlin fell very little short of ninety thousand dollars? and since, moreover, they were not sending their Dürer into exile or into the seclusion of some Rothschild's cabinet — since they were securing him a permanent and public home in his own fatherland? For is not the present capital of the Hohenzollerns peculiarly the fatherland of an ancient Nuremberger?

It is not difficult, even on our own side of the water, to learn how Dürer thought, how he drew, and how he etched; but there are only three or four pictures in the world which really show how he could *paint*, and the evidence of the others — even of the great Apostle pictures in Munich — is incomplete unless one has seen the Holzschuer portrait — and, by the way, since its recent removal to Berlin. I was for a moment perplexed by the fact that it made so much stronger an impression here than it had made when I saw it in Nuremberg a few years ago — by the fact especially that I had no recollection of its great charm of color, a thing we by no means look for first in Dürer's pictures. But my perplexity was enlightened by referring to Thausing's "*Life*," which notes that, as shown in Nuremberg, the background of the portrait had been repainted with a dark brown tone laid over that which had originally been green. Now this disfigurement has been removed and mighty indeed is the evidence afforded by the change that what to the stupid may seem an unessential detail is often, in truth, the very keystone of excellence and beauty. The portrait is a head merely — the head of a very fresh-looking old gentleman with almost white hair and beard, greenish eyes, and the rosiest of possible complexions. The frank treatment of the difficult flesh-tones in contrast with the white hair as seen against the former hard brown background was certainly not harmonious; but to-day what a difference! The grayish-white hair, the greenish-gray eyes and the grayish-green background form a peculiar and delightful harmony into which the rosy flesh-tones fit with the most perfect accord, and which the soft darks of the furred coat accent without disturbing. The manipulation is, of course, extremely detailed, but has none of the hardness we find in some of Dürer's less transcendent works; and the vigor of conception, the extraordinary life and vividness of the portrait as such are of a kind which few other hands have ever even approached. Many other portraits surpass it, of course, in some directions — have more charm, more sentiment, more idealism, more sensuous beauty in subject, in color, in chiaroscuro; but in its own way it is absolutely unsurpassable. Nothing ever was or ever could be stronger, firmer, more definite, more decided, nothing ever more accurate and incisive in character. Never could general truth be preserved and special truths be more elaborately given — never could detail be carried farther and breadth and harmony still be preserved. It is so strong, so manly, so supremely conscientious a piece of work that it almost makes one feel as though Holbein himself had shirked a little the problems of the portraitist! It is as much Holzschuer's very face, as much *nature*, as his actual flesh and blood could have been; and yet it is a most admirable work of *art* as well. Certainly it was not dear even at three hundred and fifty thousand marks.

These are not all; they are only the most conspicuous among the newer additions to the Berlin pictures. Another day I shall try to show that in other directions, too, the same energy in acquisition has been guided by the same intelligence.

M. G. VAN RENSSELAER.

OUR ILLUSTRATIONS AGAIN.

NEW YORK, June 17, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I have been a regular purchaser of the weekly issues of your publication, long before the failure of Osgood & Co. and since, but feel that I have good cause for complaint that although the price is unchanged, the quantity of the illustrations has been reduced one-third. Upon mentioning this fact at Brentano's to-day, I was told that numerous mention of the same thing had been made to them by subscribers to the paper. I do not think it a fair or proper treatment to secure regular patrons to a paper, and then reduce the size of that paper, either in the printed matter or illustrations. I, for one, shall discontinue purchasing if the paper is to continue its publication with but two sheets of engravings. And, too, I would suggest that there be found something of more general interest than the stable plans with which the paper has been deluged for the last few months. Very respectfully yours, S. V.

[IT is amusing to note that our correspondent does not see that he himself has no ground for accusing us of breach of contract with him, since, as he is not a subscriber, there does not exist between us the contract that exists in the case of prepaying subscribers. He is also somewhat hasty in voicing his complaint, since at the time of his writing we had only *once* reduced the number of illustrations, while seven weeks had passed since the failure of Messrs. Osgood & Co. We do not consider that we are bound to publish any definite number or any definite style of illustrations, and we are not pledged to do so, nor can we be properly accused of cheating because of the omission of illustrations, any more than could the editor of the *Century Magazine*, for instance, because a certain number had less wood-cuts than the last. However, to mollify our correspondent, and to prevent further "numerous mention," we will say that the omission of the illustrations and the failure of Messrs. Osgood & Co. have no connection with one another. The omission would have taken place, failure or no failure, and similar omissions will take place in future whenever we find it necessary to admonish our printers by an *argumentum ad bursam* that we will not pay them for their work unless it be better done. — EDS. AMERICAN ARCHITECT.]

TO A BUILDING-COMMITTEE.

NEW YORK, May 30, 1885.

Dear Sirs, — A press of engagements has prevented my acknowledging before this your communication of 29th ult., asking me to render your Association certain exceptional and valuable services, and to let you know "if any compensation will be required therefor."

You address me, I suppose, because my professional reputation is known to you. But I never before heard of you or of the Association you represent; and even if you were to send me the names of your committee as "the best possible guarantee" of its good intentions, I probably, having but limited acquaintance in Buffalo, should not know many or even any of them, no matter how much local weight they may carry.

Besides, a long experience with building-committees has shown me that men who have not been regularly trained as architects — and I presume none of your ten committee-men has been, or you would probably mention it — are never competent judges of design, whether as applied to construction or æsthetics, for important building projects, no matter how much talent they may have displayed in their careers, or how much success they may have attained in their special lines, or how much general cultivation they may possess; for the problems involved in such projects are far beyond the reach of the brightest amateur's resources, after even tolerably assiduous cramming. Laymen can tell what accommodation they would like, and can well enough indicate what artistic effects and what decorations in existing examples strike their fancy: but of how to secure those accommodations consistent with constructive exigencies and financial limitations, and of how to produce those artistic effects within the lines of their own project, they almost invariably know nothing.

Moreover, the older members of your committee (even if the younger ones have not had sufficient experience of business life) ought to know that, as human nature and human institutions are constituted, it is virtually impossible in practice, no matter what theory may prevail at the outset, that "merit," in regard to anything whatever — and especially in regard to an architectural competition — should be "the sole basis of choice." A judicial frame of mind, where one's own interests, feelings or tastes are concerned, is among the rarest of human attainments; and, leaving out of question the often involuntary operation of the inferior side of human nature, the working of even its finer qualities — its local affection, pride, and *esprit de corps*, its sense of family and neighborly duty, and its loyalty to friendship — the operation of any of these virtues is entirely against impartiality and really fair dealing with outsiders.

If you had on your committee one or two architects of national reputation, having no ties with your locality, and with no interest in your project beyond the intellectual one arising from a professional love and respect for the combined art and science of which they are practitioners, and no material one beyond that of earning a suitable fee for studying your special building problem, comparing the merits of the various alternatives for its treatment submitted by its competitors, and finally giving their opinion thereon, you might, on the strength of their names, induce a few of the younger architects, outside of your city, who have had no opportunity to display their real or assumed competence, and whose time has not yet reached much market value, to compete for you on terms unfair to themselves, and thus give you "something for nothing," whatever that something might or might not be worth; for it is natural that unpaid work for strangers should be rendered with much less sense of responsibility than work which is to bring its due wage. But the result of thus taking advantage of the little-employed architect's need of income, or desire for professional fame, is, I am bound to say, after much opportunity for observation, just as disappointing, in ninety-nine cases out of a hundred, to the receiver as to the giver; for such good features as may have been sponged by the process, from one or another competitor who has not yet learned the difference between the theory and the practice of "merit being the sole basis of choice," cannot, with any creditable *ensemble* as regards either mechanical or artistic homogeneousness, be incorporated into another design conceived from the entirely different standpoint supplied by another intellect. And

there is almost invariably a design on hand before any others are called for, the adoption of which — plus the unpaid or ill-paid amendments hoped for from the issue of such letters as that of yours I am now acknowledging — in preference to any other is really a foregone conclusion. One might as well attempt to concoct a medicine good for anything by mixing ingredients on the principle of following a pharmacist's list alphabetically, or purloin a scene from each playwright contemporary of Shakespeare or Sheridan, and expect to produce Hamlet or the Critic, as anticipate harmony between the systems of two different renderings of an architectural problem.

Your Association would not, I presume, admit me to any of its privileges for less than its usual admittance and maintenance dues, simply because I might desire to get something for nothing. Why should I do more for it than it would do for me? And why, being — as I have no reason to doubt it is — a solvent and reputable concern, should it pass round the hat to architects when it needs their services, instead of paying them their proper remuneration from its own funds, as it pays building contractors and manufacturers of building appliances? Architects don't live rent-free any more than they, and have to pay their assistants and draughtsmen, just as the others have to pay their clerks and workmen. My natural aptitudes, such as they may be, in the line of my vocation, my training, skill and experience, constitute my capital, just as much as your Society's securities and bank account constitute its capital. What would you think if I were to say to you that I wanted some of your cash and securities, and were to ask you what equivalent, "if any," you would "expect therefor?"

My time is fully occupied, outside of what I can spare to the American Institute of Architects, at my own price, in designing and building for such as need my services, and in consultation and arbitration, for parties here, including the city authorities, and elsewhere; and I should be happy, providing I should find your Association to be in good financial standing, to do anything for you on my usual terms, a schedule of which I enclose.

Yours truly, A. J. Bloor.

THE C. B. & Q. RAILROAD OFFICES, CHICAGO.

Chicago, June 16, 1885.

To the Editors of the American Architect: —

Dear Sirs: — Messrs. Burnham & Root are the architects of the C. B. & Q. Railroad office building in this city. Please make this correction, as by some mistake my name appeared as architect of that building in your list of buildings voted upon.

Oblige yours very truly, S. S. Beman.

NOTES AND CLIPPINGS.

Harmless Accident to a Load of Dynamite. — The safe character of dynamite was strikingly illustrated by an extraordinary accident that happened last month at Herne, in Westphalia. A cartload of the explosive was being conveyed to one of the mines of that locality. At a point in the road it was necessary to traverse the railway by a level crossing. Through a want of vigilance on the part of the gate-keeper, the cart arrived on the rails at the moment when a goods train, hidden by a curve, came up. The cart was smashed to pieces, and the dynamite cartridges were scattered all over the line, but no explosion occurred. To clear the line for the expected passenger train was now not merely a work of pressing necessity, but a matter for some anxiety on the part of the officials who were called to the spot, for, though so far the dynamite had behaved well, there was no knowing what a cartridge might do under the wheel of an engine. The train was delayed till a careful search had been made by one of the inspectors, who had in the meantime been telegraphed for. As both the horse and its driver escaped unhurt, it must be admitted that good luck played a prominent part in this accident. —*The Iron Age.*

Disintegration of Building Stone. — The sandstone commercially known as freestone, which is extensively used for building purposes in American cities, is subject to disintegration from the action of the sulphurous acid produced by the consumption of coal and from frost. There is much difference in the ability of various quarries to withstand these destructive influences. The outer surfaces of some buildings in New York and Philadelphia have been, by the advice of an eminent chemist, treated with a mixture of paraffine and carbolic acid with apparently good results. The flat surfaces are warmed by means of a stove like a plumber's stove, but with a flat side, and the paraffine when applied in a melted condition penetrates the stone readily, it is said that in some instances to the depth of one and one-half inches. Mouldings and carved work are heated by means of a blast flame from India-rubber bags of illuminating gas. Another process has been suggested, but the preliminary results do not appear to be of a satisfactory nature on account of its tendency to crack. In this process the mixture used is an artificial stone, and consists of three parts glass sand, three parts broken marble, two parts anhydrous clay, and two parts freshly slaked lime still warm. After a coat of the above has been applied wash it with water on the following day. The central portion and wings of the Capitol building at Washington were originally built of freestone, which disintegrated so rapidly as to threaten the permanence of the structure, and the whole was protected by several coats of white paint. The wings afterwards added to the above and now used for their House of Representatives and Senate Chamber, are built of white marble, which conforms in color to the central portion of the building, so that the whole building appears to be made of marble. —*Engineering.*

Discovery at St. Martin's, Canterbury. — The interesting church of St. Martin's, Canterbury, which bears the reputation of being one of the oldest, if not the oldest, in England, has lately been the scene of discoveries of great interest to archæologists, the latest made by Canon Routledge being that of a Norman hagioscope or "squint." The opening is in the northwest wall of the nave at its junction with the tower. It is a Norman insertion in a wall of Roman construction, a wall which is now seen to be similar to those which form at least the lower portions of the nave and chancel. There are regular courses of Roman brick, and the surface of the original wall has been covered with the characteristic salmon-colored mortar. A coating of common plaster, two or three inches thick, has covered up and concealed the ancient walls, which have for the most part stood intact since first entered by Roman or British Christians in the third or fourth century. The Romano-British sanctuary was afterward profaned to heathen use, or allowed to fall into decay, until it was, as Bede records, repaired and reconsecrated to Christian worship for Queen Bertha. The original fabric has undergone, in the long course of time, many changes. It was already of venerable age when the Norman builders pierced the walls to insert door or window, squint or piscina, which the still further lapse of ages once more concealed. Yet the ancient walls are there, and St. Martin's remains a memorial of Christian worship in Britain earlier by several centuries than the coming of Augustine.—*London Times.*

Safety of Iron Pillars in Cases of Fire. — We stated some time since that owing to the upper stories of a building in Berlin falling in during a fire, by the giving way of cast-iron pillars, the Prussian police authorities had issued an edict forbidding the use of cast-iron pillars in any inhabited building, but permitting the use of wrought-iron pillars. Cast-iron may only be used provided that each pillar is surrounded by a fixed casing of sheet-iron, in such a manner that there is a good air-space between the two. This edict has provoked much criticism and opposition, and several authorities have reasoned against it, as well as made experiments to disprove the assumption on which it is based. Professor Bauschinger, of Münich, recently made a long series of actual trials with pillars of both cast and wrought iron. He loaded them with the weights that they are usually allowed to bear in buildings, and heated them first to 300° Cent., then to 600° Cent., and finally to a red heat, and let a stream of cold water play on them, exactly as would be the case in a fire being extinguished by fire-engines. The cast-iron pillars were much damaged and cracked by this treatment, but continued to carry their loads quite safely, while those of wrought-iron were much bent before redness was reached, and so twisted when cold water was squirted on to them that they could not carry their loads. The conclusion is that cast-iron is really far safer for buildings than wrought. Pillars of other materials were also experimented with, viz., natural stone, brick and concrete. The latter stood the best test, resisting a fire of three hours' duration. Also pillars of ordinary brick stood very well, but granite, sandstone, and other natural stones did not show as much resistance. If the obnoxious edict of the Berlin police has done no other good, it seems at least to have set a good many people to work on this important subject.—*Engineering.*

Construction of a Dry Dock in Quicksand. — This dock was built at Hamburg for the Hamburg-American Steam Packet Company. The only available site was a narrow strip on the bank of the Elbe, perpendicular to the river, partly below high water, and the soil so loose and porous that it would only stand at a slope of 1 in 4. The excavation was 390 feet long, 66 feet broad, and about 23 feet below low-water level as a maximum. Want of space precluded the formation of a coffer-dam of several rows of sheet piles of varying heights, which would have been the safest arrangement, so it had to be constructed of a single line of sheet piling, which not only had to support the entire pressure of the surrounding soil, but, owing to its unavoidable imperfect water-tightness, allowed the water to percolate through the sides. The first step, therefore, was the setting up of four turbines for pumping out the water. The work demanded of them was the lifting of 15,275 cubic yards a maximum height of 23 feet in three and one-half hours, but they did it perfectly in half that time — that is, they lifted on an average 2.42 cubic yards per second. In order to limit as much as possible the depth to which the piles had to be driven, the bottom of the dock was not made horizontal, but rounded, to correspond with the form of a vessel, so that to drive the piles down to 23 feet below low-water level was sufficient. The space inclosed by the piling was then dredged out. The concrete employed for the foundation was formed of 9 parts Luneburg lime, 7 trass and 16 sand, mixed with twice that volume of broken stone, and was at first shot out for the entire thickness of the floor of the dock at once, by means of a wooden chute or funnel attached to a travelling crane; but this arrangement did not answer well, for the chute often splintered and broke, so that an iron one had to be substituted. After the concrete had lain three months under water the water was pumped out, and the concrete, though not perfectly set, was found sufficiently water-tight. Splinters of the wooden chute were found in the concrete floor, and their removal caused strong springs or leaks, but these were successfully stopped by iron cement. On the concrete floor the side and front walls were built of brickwork, and carried up to summer flood-level, with a rebate or recess for a caisson, and all round the dock is a quay-wall reaching above highest flood-level. After a time it was observed that the butting of the caisson against the walls loosened the mortar, and the recess was not water-tight, but it was made completely so by a facing of planed cast-iron with concrete backing. The weight of the empty dock alone is not sufficient to resist the upward thrust of the water at very high tides, but when loaded with the weight of a ship there is, of course, an abundant margin; and when no ship is in dock it is arranged that so much water shall be admitted as will satisfy the conditions of safety. The work was carried out in 1868 to 1870, and cost $325,000. —*The Iron Age.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[*Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.*]

BUILDING PATENTS.

[*Printed specifications of any patents herementioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.*]

319,436. PORTABLE BUILDING. — Jas. E. Acheson, Ainsworth, Iowa.

319,444. REFRIGERATOR BUILDING AND CHAMBER. —Robert Bogardus, Albany, N. Y., and Washington A. H. Bogardus, 2d, Chicago, Ill.

319,463. ADJUSTABLE STAGING-BRACKET.—Joseph D. Davenport, Pawtucket, R. I.

319,464. FLOOR-CLAMP. — Charles F. Dearth, East Sangerville, Me.

319,466. EAVES - TROUGH HANGER. — Gideon S. Dippry, Canton, O.

319,471. COMPOUND SPILING FOR WHARVES AND BRIDGES.—Jacob Elmer, Biloxi, Miss.

319,480. ELEVATOR SAFETY DEVICE. — Lorenzo S. Graves, Rochester, N. Y.

319,494. ROLLER FOR SLIDING-DOORS. — John H. Lawrence, Sterling, Ill.

319,509. SASH-HOLDER. — Emory G. Rust, Grand Prairie, Tex.

319,517. CABINET-MAKER'S CLAMP. — William E. Sheldon, Medford, Mass.

319,529. TRAP FOR DRAIN-PIPES.—Russell Thayer, Philadelphia, Pa.

319,532. DOOR - CHECK. — Samuel Weaver, Pottstown, Pa.

319,547. PUMP.—Chas. H. Bennett, Blossburg, Pa.

319,552. CHIMNEY-COWL. — Thomas J. Bradbeer, Detroit, Mich.

319,566. BURGLAR-ALARM. — Frank Cross, Washington, Ind.

319,575. ARTIFICIAL - STONE PAVEMENT. — John Grant, Omaha, Neb.

319,576. PARTITION-WALL. — Wm. Greisser, Chicago, Ill.

319,577. SELF-CLOSING FAUCET. — Thomas Haley, Cambridge, Mass.

319,590. VENTILATOR. — Chas. B. Loveless, Worthington, Minn.

319,592. WINDOW AND OTHER GLASS. — Michael Magrath, New York, N. Y.

319,599. COMBINED LOCK HASP AND HOOK.—Frank N. Mihills, East Beekmantown, N. Y.

319,601. STEAM-RADIATOR. — Hazen Mooers, Milwaukee, Wis.

319,620. BLIND-SLAT CHECK. — John Raccy, Quebec, Canada.

319,625. DOOR-CHECK. — Joseph F. Rowlett, Richmond, Ind.

319,639. BRICK-MACHINE. — Charles A. Tarragon, Portland, Oreg.

319,664. WINDOW-BLIND. — Asbury Barker, Peekskill, N. Y.

319,670. FIRE-PROOF FLOOR.—Joseph Bossyns, Baltimore, Md.

319,677. LUMBER-DRIER. — William E. Cole, Montgomery, Ala.

319,678. HYDRAULIC VALVE FOR ELEVATORS AND OTHER APPARATUS. —Charles R. Crane, Chicago, Ill.

319,685. WINDOW AND DOOR-SCREEN. — Edward Fales, St. Louis, Mo.

319,723. ADJUSTABLE SCAFFOLD-SUPPORT. — Jas. L. Hughes, Lawrence, Kans.

319,738. STEAM-BOILER COVERING. — Wm. H. McKinney, Evansville, Ind.

319,743. VISE. —Stephen O. Parker, Meriden, Conn.

319,750. CHIMNEY-CAP. — Patrick D. Sexton, Worcester, Mass.

319,792. WOOD-FILLER. — Jas. M. Coppernoll and John W. Brandow, Jordanville, N. Y.

319,848. KNOB. — Charles Priestland, Birmingham, England.

319,852. REAMER. — Joseph Riddell and Conrad C. Trout, Sharon, Pa.

319,869. METALLIC ROOFING.—John C. Wands, St. Louis, Mo.

319,870. SMOKE-CONSUMING STOVE AND FURNACE. —Emile R. Weston, Bangor, Me.

319,881. TRUSS-FRAME FOR ROOFS OF BUILDINGS. —William P. Buckley, Oxford, N. Y.

319,888. FIRE-ESCAPE. — John Dittrick, Smith's Falls, Ontario, Can.

319,911. LUMBER-MEASURING INSTRUMENT. — Edward Y. Knapp, Arcata, Cal.

319,913. FAUCET.—Paul Kuntzel and F. Louis Loescher, Stapleton, N. Y.

319,920. FIRE-ESCAPE. — Robert Molyneux, Ransomville, N. Y.

319,921. METALLIC ROOFING. — Levi L. Montross, Sincoe, Ontario, Can.

319,938. STAY-ROLLER FOR SLIDING-DOORS. — Albert L. Swett, Medina, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

DWELLINGS.— W. Claude Frederic, architect, is preparing plans for L. Robinson, Esq., for 2 three-st'y and basement brick and brown-stone buildings, to be erected on Madison Ave., near boundary on lot 25' x 100', to cost, $8,000.

ALTERATIONS. — Henry Fleming, Esq., is making alterations to his dwell. on Townsend St., No. 83, to cost, $1,200; from designs by W. Claude Frederick, architect.

BUILDING PERMITS. — Since our last report twenty-four permits have been granted, the more important of which are the following: —

P. J. Kirg, 4 two-st'y brick buildings (square) w s Potomac St., bet. Hudson and Dillon Sts., and 6 two-st'y brick buildings (square) e s Curley St., bet. Hudson and Dillon Sts.

F. Muesse, three-st'y brick buildings, s s Still St., bet. Light and Charles Sts.

S. A. Merchant, 2 three-st'y brick buildings, com. n e cor. Orleans and Chester Sts., and 5 two-st'y brick buildings, e s Chester St., n of Orleans St.

Wm. Goldbeck & Son, 3 two-st'y brick buildings, w s Chester St., s of Orleans St.

Henry A. Bruns, 11 three-st'y brick buildings, e s Park Ave., bet. Saratoga and Clay Sts.

W. H. Perrot, 10 two-st'y brick buildings, n s Oliver St., bet. Lucerne St. and Mine Bank Lane.

J. T. Elsrod, 15 two-st'y brick buildings (square) w s Bruce Alley, bet. Lexington and Saratoga Sts.

Baltimore Medical College, three-st'y brick building, w s Howard St., n of Madison St.

John Prinz, 2 three-st'y brick buildings, n s Eastern Ave., bet. Spring and Caroline Sts.

Boston.

BUILDING PERMITS. — *Wood. — East Eighth St., No.* 584, dwell., 30' x 40'; owner and builder, G. W. Bowker.

Akron St., Nos. 6 *and* 8, dwell., 20' x 52'; owner, Albert Cooper; builder, James Portune.

Clement Ave., near Farrington Ave., dwell., 21' and 25' 6" x 41' 2"; owner and builder, A. W. Driscoll.

Catumba St., No. 27, dwell., 24' x 39'; owner, E. W. Rundell; builder, C. H. Blodgett.

Dana St., cor. Unnamed Court, dwell., 27' x 50'; owners and builders, Pinkham & Russell.

Wyoming St., Nos. 9 *and* 11, dwell., 24' x 35'; owner and builder, S. M. Shapleigh.

Mather St., Nos. 49-55, 4 dwells., 23' x 28'; owner, Asa A. Wheeler; builder, N. T. Ryder.

East Ninth St., Nos. 588-592, 3 dwells., 20' and 25' x 30' and 55'; owner, Milton N. Page; builder, D. A. Berry.

Pynchon St., No. 59, carriage-house, 30' x 30'; owner, Henry Pfaff; builder, J. B. Hunter.

Florence St., near Ashland St., dwell., 20' and 25' 6' x 30'; owner, Thomas Fowler; builder, A. Rogers.

Brooklyn.

BUILDING PERMITS. — *Park Ave.*, n s, 75' w Marcy Ave., three-st'y frame tenement, tin roof; cost, $4,000; owner and builder, George Straub, 11 Lewis Ave.; architect, Th. Engelhardt.

Ellery St., s s, 75' w Marcy Ave., three-st'y frame tenement, tin roof; cost, $4,000; owner, architect and builder, same as last.

Douglass St., No. 157, n s, 225' w Bond St., four-st'y brick tenement, tin roof, wooden cornice; cost, $5,500; owner, Margaret E. O'Neil, 119 Hoyt St.; builders, J. Kelly and Jno. O'Neil.

Montague St., No. 82, s s, 25' w Hicks St., five-st'y brick store and tenement, tin roof; cost, $14,500; owner, H. H. Dickinson, 74 Montague St.; architect and builder, O. K. Buckley, Jr.

South Third St., n s, abt. 100' e Fourth St., five-st'y brick and Nova Scotia stone extension to Industrial School, etc., slate roof; cost, abt. $30,000; owners, Industrial School Association, on premises; architect, J. Welch; builders, W. & T. Lamb, Jr., and C. L. Johnson's Sons.

Somer St., s s, 80' e Sackman St., 3 two-st'y and cellar frame dwells., tin roofs; cost, each, $2,500; owner, Mrs. Dora Fagan, 1432 Broadway, Brooklyn; architect, C. L. D'Spatthoff; builder, B. Fagan.

Willoughby Ave., No. 724, s s, 80' e Sumner Ave., three-st'y brick dwell., tin roof; cost, $6,668; owner, Mrs. Catharine Walsh, 119 Sumner Ave.; architect, Th. Engelhardt; builder, M. C. Rush.

Maujer St., n s, 25' e Waterbury St., three-st'y frame tenement (brick-filled) tin roof; cost, $4,000; owner, Charles Marhoefer, 295 Maujer St.; builders, D. Kreuder and C. Buchheit.

Lee Ave., s e cor. Middleton St., 4 three-st'y frame tenements (brick-filled) gravel roof; cost, $5,000 and $4,500 each; owner, John T. Hall, 5 West Thirty-sixth St., New York; architects, G. P. Chappell & Co.; builders, R. B. Ferguson and C. King.

Dikeman St., s s, 92' w Van Brunt St., three-st'y frame tenement, tin roof; cost, $3,500; owner, Thos. Regan, 121 Dikeman St.; architect and builder, Jno. Smidt.

Ten Eyck St., No. 209, n s, near Bushwick Ave., three-st'y frame tenement, tin roof; cost, $4,300; owner, Wilhelm Werthmuller, on premises; architect, H. Vollweiler; builders, D. Kreuder and —— Welsh.

Livingston St., n s, 160' e Court St., four-st'y brown-stone wing to institute, tin roofs; cost, $9,500; architect, Joseph Platt; builders, J. Thatcher and E. S. Boyd.

Lafayette Ave., s s, 320' w Sumner Ave., three-st'y brown-stone dwell., tin roof; cost, $5,000; owner and builder, Henry McQuilkin, 968 Lafayette Ave.; architect, I. D. Reynolds.

Monroe St., n s, 150' w Stuyvesant Ave., 3 four-st'y brick and brown-stone dwells., tin roofs; cost, $3,800; owner, G. De Revere, 629a Madison Ave.; architect, A. Hill.

Throop Ave., s e cor. Macon St., three-st'y brick school-house, tin roof, wooden cornice; cost, $20,000; owner, Church of Our Lady of Victory; architect, P. C. Keely; masons, McDermott & Ivers.

Herkimer St., s w cor. Russell Pl., 6 two-st'y brick dwells., gravel roofs; cost, each, abt. $3,000; owners, Felix Gallagher and John Taaffe, 130 Court St.; architect and builder, Jno. Taaffe.

Hamburg St., n e cor. George St., 3 three-st'y and two-st'y frame (brick-filled) stores and tenements, tin roofs; cost, $16,000; owner and architect, N. Wabe, 87 Melrose St.; builder, J. Rueger.

Magnolia St., n s, 175' e Knickerbocker Ave., two-st'y frame dwell., slate and tin roof; cost, $4,000; owner, C. Krawer, Grand St., cor. Union Ave.; builders, M. Metzger and E. Loerch.

Conselyea St., s s No. 74½, three-st'y frame tenement, tin roof; cost, $4,300; owner, Patrick Cullen, 134 Skillman Ave.; architect, H. Vollweiler; builders, P. Burns and Mead & Son.

Flatbush Ave., e e cor. St. Marks Ave., seven-st'y brick Carlisle stone and terra-cotta apartment-house, Sparham fire-proof cement roofing; cost, $150,000 to $200,000; owner, Wm. H. Scott, 33 Wall St.; architect, M. W. Morris.

Halsey St., No. 140, three-st'y brown-stone dwell., tin roof; cost, $6,500; owner, architect and builder, John S. Frost, 568 Franklin Ave.

ALTERATIONS. — *Clinton St., No.* 376, remove front wall, rebuild with brick and brown-stone; also, four-st'y brick extension, tin roof; cost, $9,000; owner, E. M. Van Tassell, Murray Hill Hotel, New York; architects, A. Zucker & Co.

Albany Ave., s e cor. St. Marks Ave., repair damage by fire; also, one-st'y brick extension, tin roof, chapel reformed, etc.; cost, $40,000; owners, R. C. Orphan Asylum Soc., Brooklyn, on premises; architect, W. Schickel; builders, P. Carlin & Sons and Morris & Selover.

Columbia St., No. 189, one-st'y brick extension, gravel roof; also, interior alterations and new store front; cost, $3,500; owner, H. K. Thurber, 146 West Twelfth St., New York; architect, G. E. Harding; builder, G. R. Truman.

Calyer St., No. 113, raised 20'; also, three-st'y st'y frame extension, gravel roof; cost, $4,000; owner, Mrs. Emma Camm, 271 South Eighth St., Newark, N. J.; architect and builder, M. S. Brade.

Court St., Nos. 240 *and* 242, add three stories; also four-st'y brick extension, front and interior alterations; cost, $18,000; owner and architect, James H. Keeler, 130 Dean St.; builder, G. H. Truman.

Chicago.

BUILDING PERMITS. —S. L. & W. J. Walker, two-st'y flats, 891 Warren Ave.; cost, $3,500.

S. F. Bennett, three-st'y store and flats, 423 Ogden Ave.; cost, $5,700; architect, H. Copeland.

Mrs. J. M. Jewett, two-st'y dwell., 3300 Vernon Ave.; cost, $6,000; architect, H. F. Starbuck.

D. F. Bacon, 2 two-st'y dwells., 3302 to 3304 Vernon Ave; cost, $8,500.

J. Wahne, two-st'y store and dwell., 3213 Parnell St.; cost, $3,000.

Mrs. M. Wendell, 2 two-st'y dwells., 3107 to 3109 Forest Ave.; cost, $10,000; architects, Treat & Foltz.

C. C. Busse, 2 three-st'y stores and flats, 518 to 520 West Harrison St.; cost, $14,000; architect, W. H. Drake.

S. J. Dorgan, two-st'y flats, 233 Centre Ave.; cost, $3,500.

H. Koller, three-st'y dwell. and stores, 815 to 818 West Lake St.; cost, $6,000.

W. Spengler, three-st'y store and dwells., 1214 to 1216 Milwaukee Ave.; cost, $18,000; architect, H. Kley.

W. Cuthbertson, two-st'y dwell., 156 North Carpenter St.; cost, $3,000; architect, A. Smith.

J. Backle, two-st'y dwell., 348 Twenty-fourth St.; cost, $2,800; architect, A. Boen.

H. H. Murray, 2 two-st'y dwells., 73 Bryant St.; cost, $5,000; architect, T. C. Meridith.

F. Headen, four-st'y store and dwell.; cost, $18,000; architects, Edbrooke & Burnham.

R. W. Hyman, Jr. & Co., repair, 79 to 81 Wabash Ave.; cost, $15,000.

V. Koanowsky, three-st'y addition, 671 Throop St.; cost, $4,000.

F. Samulski, two-st'y dwell., 18 Brigham St.; cost, $2,500.

J. Coughlan, four-st'y store and flats, 479 West Madison St.; cost, $14,000; architect, W. W. Boyington.

W. H. Keep, three-st'y dwell., 387 Dearborn Ave.; cost, $8,000; architects, Cobb & Frost.

R. Healet, three-st'y flats, 167 Tremont St.; cost, $4,000.

H. Wettezer, two-st'y dwell., 563 Lasalle St.; cost, $7,500; architect, H. Hanson.

P. Yoehen, three-st'y store and dwell., 339 Thirty-second St.; cost, $2,700.

C. W. Division Railroad Co., two-st'y barn, 1923 to 1937 Lake St.; cost, $15,000.

J. Richards, 7 two-st'y dwells., 3242 to 3254 Rhodes Ave.; cost, $28,000; architect, W. A. Furber.

W. Carberry, two-st'y flats, 3800 Prairie Ave.; cost, $4,500; architect, J. Frank.

E. Gross, 7 cottages; cost, $7,000.

L. Eberhardt, three-st'y stores and dwells., 214 Wells St.; cost, $6,500; architect, J. Otto.

C. P. Hall, two-st'y dwell., 2944 Vernon Ave.; cost, $8,000.

P. Bayens, three-st'y dwell., 121 Elston Ave.; cost, $2,500.

F. W. Schmidt, two-st'y dwell., 12 Lincoln Pl.; cost, $3,500.

F. Huebner, three-st'y store and dwell., 479 West Chicago Ave.; cost, $7,000.

S. Kirk, two-st'y dwell., 51 Warren Ave.; cost, $3,500.

J. Helmke, three-st'y store and flats, 1086 Milwaukee Ave.; cost, $10,000; architect, H. Kley.

L. J. Haltzman, 2 two-st'y dwells., 210 to 212 Morgan St.; cost, $8,000.

W. H. Withington, 2 two-st'y dwells., 3631 to 3633 Prairie Ave.; cost, $6,000; architect, N. W. Warren.

W. Lloyd, 2 two-st'y dwells., 851 to 853 Monroe St.; cost, $9,000; architect, J. Van Osdel.

W. Lloyd, two-st'y dwell., 118 Leavitt St.; cost, $4,000.

J. Cremens, 3 cottages, 173 to 175 McGregor St.; cost, $2,500.

C. Fresche, three-st'y flats, 543 Larrabee St.; cost, $4,000.

H. Wellman, two-st'y store and dwell., 426 North Ashland Ave.; cost, $5,200.

W. A. Williams, three-st'y dwell., 60 Beethoven Pl.; cost, $5,000; architect, Berlin.

H. Sellhorn, two-st'y dwell.; cost, $2,800.

H. Van Heine, three-st'y store and dwell., 332 Blue Island Ave.; cost, $8,000.

Mrs. M. L. Bates, two-st'y dwell., 490 West Adams St.; cost, $4,000.

P. Schmidt, three-st'y dwell., 111 Warren Ave.; cost, $6,000; architect, C. O. Hansen.

G. Hallman, 2 two-st'y dwells., 659 to 661 North Ave.; cost, $4,000.

G. L. Shultz, two-st'y flat, 1119 Twelfth St.; cost, $2,800.

Mrs. A. Dixon, 3 two-st'y dwells., 3130 to 3134 South Park Ave.; cost, $11,000; architect, C. M. Palmer.

A. Bierma, two-st'y flats, 403 West Erie St.; cost, $2,500; architect, G. H. McAffee.

New York.

FLATS.—On the s w corner of Third Ave. and Ninety-sixth St. 4 five-st'y brick and stone flats and stores, to cost $90,000, are to be built from plans of Messrs. Schwarzmann & Buchman.

On the w s of Third Ave., 25' s of One Hundred and Sixth St., 3 five-st'y brick and brown-stone flats and store, to cost $50,000, are to be built by Mr. J. D. Karst, Jr., from plans of Mr. R. Berger.

HOUSES.—On the w s of New Ave., bet. One Hundred and Fifteenth and One Hundred and Sixteenth Sts., 12 three-st'y and basement brick, stone and terra-cotta houses are to be built by Mr. Wm. F. Lett, at a cost of about $95,000, from plans of Mr. D. T. Atwood.

On the s s of Seventy-second St., 300' e of Tenth Ave, Mr. G. J. Hamilton will build five 20' front dwells., from plans of Messrs. Thom & Wilson.

On the n s of Eighty-second St., commencing 100' w of Tenth Ave., 6 three-st'y and basement brick and stone dwells. are to be built for Mr. R. Westbrook Myers, from plans of Mr. Wm. Baker, at a cost of about $66,000.

On the n s of Sixty-ninth St., commencing 80' e of Madison Ave., 5 four-st'y brick, brown-stone and terra-cotta houses, to cost $175,000, are to be built from plans of Messrs. Chas. Buck & Co.

STORE BUILDING.—For J. Smith Rice a store building, 26' x 75', five stories high, is to be erected on the n w corner of Broadway and Howard Sts. from designs of Messrs. A. Zucker & Co.

BUILDING PERMITS.—*Ludlow St., No.* 69, five-st'y brick tenement, with store, tin roof; cost, $18,000; owner, Adolph Eckeberg, 71 Ludlow St.; architect. Wm. Graul.

Second Ave., No. 2363, three-st'y brick tenement with store, tin roof; cost, $5,000; lessee, John Lally, 2361 Second Ave.; architect, J. S. Wightman.

New Ave., n w cor. One Hundred and Fifth St., 6 three-st'y stone and brick dwells., tin roofs; cost, each, $10,000; owner, F. A. Seitz, 315 East Forty-second St.; architect, J. M. Dunn.

Tenth Ave., s w cor. One Hundredth St., five-st'y brick tenement, tin roof; cost, about $20,000; owner, Seth M. Milliken, 990 Madison Ave.; architect, R. Berger.

One Hundred and Forty-first St., n s, 75' w Seventh Ave., 2 two st'y and attic frame dwells., tin roofs; cost, each, $5,000; owner, Malvina Hammerstein, 203 East One Hundred and Fifteenth St.; architect, A. I. Finkle.

One Hundred and Forty-second St., s s, 75' w Seventh Ave., 4 two-st'y and attic frame dwells., tin roofs; cost, each, $5,000; owner, etc., same as last.

St. Nicholas Ave., n e cor. One Hundred and Twenty-sixth St., four-st'y brick and terra-cotta flat, tin and mansard roof; cost, $40,000; owner, Nassau Building Co., 20 Nassau St.; architect, A. I. Finkle.

Mott Ave., w s, 100' s One Hundred and Thirty-eighth St., two-st'y brick stable, shed, office and dwell., gravel roof; cost, $4,500; owners, Wilson, Adams & Co., One Hundred and Thirty-eighth St. and Fourth Ave.; architect, Theo. E. Thomson.

Tenth Ave., e s, 104' 10" n Forty-ninth St., five-st'y brick tenement and store, tin roof; cost, $10,000; owner and architect, same as last.

East Twentieth St., No. 353, four-st'y brick cigar-factory, tin roof; cost, $10,000; owner, John Foster, 203 East Nineteenth St.; architects, Berger & Baylies.

Fortieth St., n s, 150' e Eighth Ave., 2 five-st'y brown-stone front tenements, tin roofs; cost, each, $18,000; owner, Margaret Smith; architects, A. B. Ogden & Son.

Eighth Ave., Nos. 573 *and* 575, five-st'y brick and stone tenement and store, metal roof; cost, $18,000; owner, Gustav Harlem, 669 Eighth Ave.; architect, John B. Snook.

Tenth Ave., n w cor. Forty-seventh St., five-st'y brick tenement and store, tin roof; cost, $18,000; owners, Trustees of the Estate of Henry Astor, 1477 Broadway; architect, John Sexton; builders, Van Dolson & Arnott and James H. Studley.

East Eightieth St., Nos. 4, 6, 8, 10 *and* 12, 5 four-st'y brown-stone front dwells., tin roofs; cost, $125,000; owners, G. N. & N. A. Williams, 337 and 343 East Sixty-eighth St.; architects, Chas. Graham & Son.

East Eighty-first St., Nos. 405, 407, 409 *and* 411, 4 five-st'y brick tenements, tin roofs; cost, total, $52,000; owner, Francis J. Schnugg, 433 East Eighty-sixth St.; architect, Julius Kastner.

Eighty-sixth St., s s, 150' e Fourth Ave., 4 four-st'y brick and stone dwells., tin roofs; owner, Phil. Braender, 1644 Ave. B; architect, John Brandt, 1491 Third Ave.

East One Hundred and Eighteenth St., No. 343, five-st'y brick flat, tin roof; cost, $18,000; owner and builder, Frank E. Dewitt, 25 East One Hundred and Thirty-third St.; architect, R. Rosenstock.

Seventy-second St., s w cor. Lexington Ave., 5 four-st'y brown-stone front dwells., tin roofs; cost, each, $23,000; owners, architects, and contractors, Breen & Nason, 341 East Fifty-ninth St.; mason, Geo. W. Hughes.

Seventy-sixth St., n s, 120' e Madison Ave., four-st'y brick flat, tin roof; cost, $16,000; owner, Thos. A. Martin, Astoria, L. I.; architects, A. B. Ogden & Son.

One Hundred and Fourteenth St., s s, 100' w Third Ave., 2 four-st'y brown-stone front tenements, tin roofs; cost, each, $12,000; owner, Stephen Talbert, 148 East One Hundred and Twenty-third St.; architect, J. H. Valentine.

One Hundred and Twentieth St., n s, 180' w Third Ave., one-st'y brick workshop, gravel roof; cost, $3,000; lessee, David C. Carleton, 208 East One Hundred and Twenty-sixth St.; architect, Chas. Baxter.

Eighth Ave., n w cor. One Hundred and Twenty-third St., 2 five-st'y brick flats and stores, and 3 on *One Hundred and Twenty-third St.*, 2 three-st'y dwells. and one four-st'y dwell., tin roof; cost, $60,000 for stores and $30,000 for dwells.; owner, H. Josephine Wilson, 325 East Fourteenth St.; architect, D. T. Atwood; builder, R. Wilson.

Eighty-second St., n s, 100' e Ninth Ave., 4 four-st'y brown-stone front dwells., tin roofs; cost, each, $18,000; owner, Mrs. Margaret Deeves, 360 West Eighty-third St.; architect and builder, Richard Deeves.

Seventy-fourth St., s e cor. Eleventh Ave., 9 three and four st'y brick and stone dwells., slate and tin roofs; owners and architects, Lamb & Rich, 265 Broadway; builders, Alex. Brown and J. J. Brown.

Eighth Ave., s e cor. One Hundred and Twenty-third St., five-st'y brick apartment-house and store, tin roof; cost, $90,000; owner, H. Josephine Wilson, 325 East Fourteenth St.; architect, D. T. Atwood; builder, R. Wilson.

One Hundred and Twenty-seventh St., n s, 150' w Sixth Ave., 2 five-st'y brick flats and a one-st'y stable, tin roofs; cost, total, $29,000; owner, D. S. Slawson, 355 Lexington Ave. and L. Horton, 222 East Forty-sixth St.; architect, H. L. Heins.

One Hundred and Forty-fifth St., s s, 500' w Boulevard, two-st'y frame dwell., shingle roof; cost, $12,000; owner, Victor Durand, 2015 Ninth Ave.; architect, Geo. M. Walgrove.

One Hundred and Twenty-sixth St., n w cor. Lexington Ave., four-st'y brick flat and store, tin roof; cost, $10,000; owner, Mary A. Davis, 2098 Lexington Ave.; architect, R. Rosenstock.

One Hundred and Thirty-third St., s s, 200' e Eighth Ave., 3 four-st'y brick tenements, tin roofs; cost, each, $20,000; owners, F. & C. Pfluger, 77 West Fifty-fifth St. and 244 Sixth Ave.; architect, A. H. Blankenstein.

St. Nicholas Ave., s e cor. One Hundred and Fiftieth St., three-st'y brown-stone front dwell., slate roof; cost, $35,000; owner, John W. Fink, 243 West Fifty-sixth St.; architect, R. Rosenstock; builders, Jacob Vix & Sons and John L. Hamilton.

Ninety-first St., s s, 82' 3" w Fourth Ave., 4 three-st'y brown-stone dwells., tin roofs; cost, each, $15,000; owner, Edward Hilson, 123 East Eightieth St.; architects, Schwarzman & Buchman; builders, List & Lennon.

Lexington Ave., n w cor. Ninety-first St., 4 three-st'y and basement brick and brown-stone dwells., tin roofs; cost, each, $11,000; owners, J. & L. Weber, 1121 Madison Ave.; architect, A. Weber.

Third Ave., s w cor. Ninety-seventh St., 5 five-st'y brown-stone tenements, tin roofs; cost, each, $18,000; owner, James A. Frame, 105 East Seventieth St.; architects, Thom & Wilson.

Fourth Ave., n w cor. Eighty-fourth St., five-st'y brick store and tenement, tin roof; cost, $25,000; owner, James Meehen, 215 East Sixty-first St.; architect, H. J. Hardenbergh.

ALTERATIONS.—*Broadway, No.* 1721, add one st'y, also four-st'y brick extension, tin roof, new front wall, etc.; cost, $18,000; owner, John Downey, 64 East Sixty-fourth St.

East Fourteenth St., Nos. 106 *and* 108, first st'y walls, front and rear alterations and repairs; cost, $4,000; lessee, G. H. Thurber, on premises; owners, Geissenheimer Bros., New York, and J. C. Brown Estate, Providence, R. I.; architect, J. Hoffman.

West Eighteenth St., Nos. 148 *and* 150, interior alterations; cost, $6,000; owner, Hugh O'Neill, 149 West Twentieth St.; architect, Mortimer C. Merritt.

West Eleventh St., No. 269, add one-half st'y, flat tin roof; also four-st'y brick extension, tin roof, interior alterations; cost, $10,000; owner, Fanny Wood, 271 West Eleventh St.; architect, B. J. Schweitjer; builders, H. Andruss and A. C. Hoe & Co.

East Fifty-eighth St., No. 9, four-st'y front and three-st'y on rear brick extension, slate roof; cost, $55,000; owner, H. H. Hollister, 13 East Fifty-seventh St.; architect, B. L. Gilbert; builders, E. D. Gurnsey and E. Smith.

Fifth Ave., s e cor. Fiftieth St., seven-st'y brick extension, L-shaped; cost, $175,000; owner, George Kemp, 720 Fifth Ave.; architect, R. C. Jones.

East Twenty-second St., No. 7, altered for art gallery, roof raised and pierced for skylights, etc.; cost, $225,000; owner, Jas. T. Sutton, 62 West Forty-ninth St., and William Kurtz, 9 East Twenty-third St.; architect, H. E. Ficken.

Washington St., Nos. 446 *to* 470, eight-st'y brick extension, tin roof; cost, $10,000; owner, Estate of Robert Gaston; architect, Thomas R. Jackson.

First Ave., e s, 235' e, from Thirty-ninth to Fortieth St., one-st'y brick extension to boiler-room; cost, $4,500; owner, The Equitable Gas Light Co., 340 Third Ave.; builder, Richard Deeves.

Broadway No. 770, raise attic to full story, also internal alterations, new beams, etc.; cost, $5,000; lessee, C. D. Fredericks, on premises; builder, Jno. B. Franklin.

Madison Ave., Nos. 66 *and* 68, raise roof and extend the seventh story to front of main building; cost, $6,000; owner, Aaron Barnett, 785 Madison Ave.; architects, A. B. Ogden & Son.

West St., No. 85, raise building seven feet, internal alterations, new store front, etc.; cost, $4,000; owner, Chas. Spear, 2032 Fifth Ave.; architects, Thom & Wilson.

West Forty-third St., No. 111, internal alterations, three-st'y brick extension, tin roof; cost, $10,000; owners, Bernhard Thompson and wife, 111 West Forty-third St.; architect, Jas. Stroud.

Second Ave., No. 154, four-st'y and basement brick extension, tin roof; also take out front wall in first story and put in iron girder and posts; cost, $6,000; owner and architects, Julius Kastner, 744 Broadway.

Eighteenth St., n s, 122' w Eighth Ave., three-st'y brick extension, tin roof, and new stairs, etc.; cost, $9,700; owner, Eighteenth-street Methodist Episcopal Church, Edward Berrian, President, 354 West Eighteenth St.; architect, H. S. Bush; builders, McKenzie & McPherson.

Fifth Ave., No. 1308, internal alterations, resetting partitions, etc., rear wall in first story taken out, and an iron girder put in, etc.; cost, $5,000; owner, Isaac Cahn, 1309 Fifth Ave.; architects, Schwarzman & Buchman.

Liberty St., Nos. 33 *and* 35, and *Maiden Lane, Nos.* 48 *and* 50, first-st'y front on Maiden Lane altered for store purposes, upper floors altered for offices, new elevator, etc.; cost, $13,000; lessee, August Heckscher, 95 Liberty St.; architect, John W. Ritch; builders, Henry Andruss and Edward Gridley.

West Twenty-eighth St., No. 425, two-st'y brick extension, tin roof; cost, $3,000; owner, C. S. Fischer, 152 West Fifty-eighth St.; architect, U. B. Tubbs; masons, Sinclair & Wills and J. C. Wessells.

Madison Ave., n e cor. One Hundred and Twenty-ninth St., one-st'y brick vestry-room extension; cost, $3,000; owner, All Saints' Church, One Hundred and Thirtieth St. and Madison Ave.; architects, Renwick, Aspinwall & Russell.

East Fifteenth St., No. 537, repair damage by fire; cost, $3,000; owner, James Mulry, 30 East Eighty-first St.

West Fortieth St., No. 44, extension, iron beams; cost, $3,500; owner, Lillie M. Martin, 50 West Fortieth St.; architects and builders, C. Graham & Sons.

East Forty-seventh St., Nos. 231 *to* 237, and *Second Ave., Nos.* 887 *and* 889, internal alterations, iron columns and girders, elevator put in; cost, $5,000; owner, Merchants' Storage and Warehouse Co., on premises; architect, E. E. R. Tratman; masons, J. & L. Weber.

East Twenty-first St., Nos. 137 *and* 139, internal alterations, new vaults, etc., general repairs; cost, $10,000; owner, J. R. Conway, 14 Lexington Ave.; builders, T. Joyce & Son.

Twenty-ninth St., s s, 420' e First Ave., altered for electric-lighting station, iron beams; cost, $3,000; owner, U. S. Illuminating Co., 59 Liberty St.; builders, Berton & Nickel.

West Eighty-third St., Nos. 355–357, raised one-st'y and two-st'y brick extension, tin roof; cost, $9,500; owners, B. F. Romaine, Jr., and L. T. Romaine, 507 Madison Ave.; architect, A. Namur; builders, V. J. Hedden & Sons.

Philadelphia.

BUILDING PERMITS.—*Twenty-first St.*, cor. Diamond St., Park Ave. Baptist Church, with Sunday-school attached, 50' x 83', to be built of Trenton stone; Rev. Mr. Retner, pastor; Messrs. Hazelhurst & Huckel, architects.

Walnut St., No. 1727, four-st'y house, 22' x 106', to be finished in hard wood; J. McDowell, Esq., owner; architects, same as last.

Morris St., e of Swanson St., two-st'y stable, 57' x 144'; Baugh & Sons, owners; Hazlehurst & Huckel, architects.

Tioga St., w of railroad, three-st'y twin house, 18' x 57', with mansard roof; Mr. Clemer, owner; Hazelhurst & Huckel, architects.

Spring Garden St., No. 2120, remodelling back building and new stone front in main building; W. Frederick Snyder, Esq., owner; Hazelhurst & Huckel, architects.

Fifth St., n w cor. Green St., office-building; owner and architects, same as last.

Fifth St., cor. York St., hall and assembly-rooms for the Delaware Club, adjoining present club-house, 100' long; Hazelhurst & Huckel, architects.

Pulaski Ave., near Apsley St., 8 two-st'y dwells., 16' x 53'; Rea & Riley, contractors.

Bowman St., n of Thirty-fifth St., two-st'y dwell., 17' x 50'; C. C. Linahan, contractor.

Fountain St., e of Tippen St., 2 three-st'y dwells., 20' x 32'; G. B. Righter, contractor.

Cabot St., w of Eighteenth St., two-st'y stable, 16' x 32'; E. W. Morjer, contractor.

South Nineteenth St., No. 224, three-st'y dwell., 32' x 115'; E. Mentz & Son, contractors.

Ninth St., s of Ontario St., morocco-factory, 24' x 110'; B. Walker, contractor.

Aspen St., s of Chestnut St., three-st'y dwell., 20' x 47'; G. McNicholson, contractor.

Chelten Ave., near Hancock St., three-st'y dwell., 23' x 54'; T. Wright & Son, contractors.

South St., cor. Thirty-third St., bath-house, 56' x 124'; J. Bradley, contractor.

Seventy-first St., cor. Greenway Ave., 3 two-st'y dwells., 18' x 54'; John Welsh, contractor.

Church St., e of Nash St., two-st'y dwell., 18' x 43'; M. Hetzel, contractor.

North Twenty-fifth St., No. 1250, two-st'y back building, 16' x 50'; J. C. Morrison, contractor.

Nassau St., No. 2408, two-st'y dwell., 16' x 36'; E. Schmidt, contractor.

Twenty-second St., cor. Lalona St., 2 two-st'y dwells., 16' 8" x 40'; G. Sidebottom, contractor.

Howard St., cor. Thompson St., three-st'y dwell., 18' x 30'; Jos. McNutt, contractor.

Twenty-second St., e of Ellsworth St., 11 two-st'y dwells., 16' x 41'; Robt. Mitchell, contractor.

Twenty-fifth St., above Columbia Ave., 5 three-st'y dwells., 15' x 50'; J. S. Allbright, owner.

Thompson St., cor. York St., foundry, 30' x 65'; Wechter & Sons, contractors.

St. Louis.

BUILDING PERMITS.—Sixty permits have been issued since our last report, sixteen of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows:—

Habsey C. Ives, two-st'y brick dwell.; cost, $8,000; Eames & Young, architects; Kerr & Allen, contractors.

E. Schulter, three-st'y brick business building; cost, $5,000; C. F. May, architect; B. Weber & Co., contractors.

St. Louis Public Schools, one-st'y school-room; cost, $5,690; O. Walhelmi, architect; H. R. Becker, contractor.

Mrs. L. Lindhurst, two-st'y double brick tenement; cost, $4,500; Chas. F. May, architect; Henry Dresss, contractor.

Mrs. C. Green, two-st'y double brick dwell.; cost, $3,500; John Waters, contractor.

John P. Tichocheck, two-st'y double brick store and tenement; cost, $6,500; F. Mueller, contractor.

Mrs. H. Loury, two-and-one-half-st'y double dwell.; cost, $7,500; C. C. Helmers & Bro., architects; J. Strimple, contractor.

Mrs. A. Cunningham, two-st'y brick dwell.; cost, $2,900; D. Crigen, contractor.

H. W. Kalterwasser, two-st'y brick dwell.; cost, $3,000; Martell & Johnson, contractors.

Mrs. Griesmeyer, two-st'y brick dwell; cost, $3,000; Hy Meyer, contractor.